The `revtex4-2` document class of the American Physical Society *

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This file embodies the implementation of the APS REVTEX 4.2 document class for electronic submissions to journals.

The distribution point for this work is https://journals.aps.org/revtex/, which contains fully unpacked, prebuilt runtime files and documentation.

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*Work under hire to American Physical Society. Version 4.2e © 2019 American Physical Society

†First revision of REVTEX4.0 (unreleased) by David Carlisle, all released versions of 4.0 and 4.1 by Art Ogawa, 4.2a (unreleased) by Aptara, 4.2b,c by Mark Doyle

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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.

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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.

```
%revtex4-2.dtx
%
```

1.1.2 Generated by tex revtex4-2.dtx

Typesetting ths file under TEX itself runs the installer, which generates the package files.

```
%revtex4-2.cls, revtex4.ins, revtex4.drv, aps4-2.rtx,
%aps10pt4-2.rtx, aps11pt4-2.rtx, aps12pt4-2.rtx, revsymp.sty
%
```

1.1.3 Generated by `pdflatex revtex4-2.dtx`

Typesetting the source file under LaTeX generates the documentation.

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

1.1.4 Auxiliary

The following are auxiliary files generated in the course of running LaTeX:

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

2 Code common to all modules

The following may look a bit klootchy, 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 LaTeX 2_ε. An appropriate message is displayed if a different TeX format is used.

```
%<*doc|kernel|aps|rmp|revsymb>
\NeedsTeXFormat{LaTeX2e}[1996/12/01]%
%</doc|kernel|aps|rmp|revsymb>
%<kernel>\ProvidesClass{revtex4-2}
%<aps>\ProvidesFile{aps4-2}
%<rmp>\ProvidesFile{apsrmp4-2}
%<10pt>\ProvidesFile{aps10pt4-2}
%<11pt>\ProvidesFile{aps11pt4-2}
%<12pt>\ProvidesFile{aps12pt4-2}
%<revsymb>\ProvidesPackage{revsymb4-2}
%<*doc>
\ProvidesFile{revtex4-2.dtx}
%</doc>
%<*!package&!options>
%<version>
 [2020/10/03 4.2e (https://journals.aps.org/revtex/ for documentation)]% \fileversion
%</!package&!options>
```

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

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

3 The driver module `driver`

This module, consisting of the present section, typesets the programmer's documentation, generating the `README-REVTEX.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.

```
%<*doc>
```

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

```
\documentclass{ltxdoc}
\RequirePackage{ltxdocext}%
\let\url\undefined
\RequirePackage[colorlinks=true,linkcolor=blue]{hyperref}%
```

We ask for the usual indices and glossaries.

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

3.0.1 Docstrip and info directives

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

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

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

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

3.1 The Frontmatter File

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

```
\begin{filecontents*}{README-REVTEX.tex}
\title{%
 The \classname{revtex4-2} document class of the American Physical Society%
 \protect\thanks{Work under hire to American Physical Society. Version \fileversion\ \copyright
}%
\author{Arthur Ogawa and Mark Doyle%
 \protect\thanks{First revision of REV\TeX4.0 (unreleased) by David Carlisle, all released vers
}%
\date{Version \fileversion, dated \filedate}%
\newcommand\revtex{REV\TeX}

\maketitle

This file embodies the implementation of the APS \revtex\ 4.2 document class
for electronic submissions to journals.

The distribution point for this work is
\url{https://journals.aps.org/revtex/},
```

```
which contains fully unpacked, prebuilt runtime files and documentation.

\tableofcontents

\section{Using \protect\revtex}

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

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

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

\changes{4.0a}{1998/01/16}{Initial version}
\changes{4.0a}{1998/01/31}{Move after process options, so \cs{clearpage} not in scope of twocol
\changes{4.0a}{1998/01/31}{Rearrange the ordering so numerical ones come first. AO: David, what
\changes{4.0a}{1998/01/31}{use font-dependent spacing}
\changes{4.0a}{1998/01/31}{4.0d had twoside option setting twoside switch to false}
\changes{4.0a}{1998/01/31}{Move after process options, so the following test works}
\changes{4.0a}{1998/01/31}{print homepage}
\changes{4.0a}{1998/01/31}{protect against hyperref revtex kludges which are not needed now}
\changes{4.0a}{1998/06/10}{multiple preprint commands}
\changes{4.0a}{1998/06/10}{comma not space between email and homepage}
\changes{4.0a}{1998/06/10}{single space footnotes}
\changes{4.0b}{1999/06/20}{First modifications by Arthur Ogawa (mailto:arthur\_ogawa at sbcglob
\changes{4.0b}{1999/06/20}{Added localization of \cs{figuresname}}
\changes{4.0b}{1999/06/20}{Added localization of \cs{tablesname}}
\changes{4.0b}{1999/06/20}{AO: all code for \protect\classoption{10pt} is in this module.}
\changes{4.0b}{1999/06/20}{AO: all code for \protect\classoption{11pt} is in this module.}
\changes{4.0b}{1999/06/20}{AO: all code for \protect\classoption{12pt} is in this module.}
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\changes{4.0b}{1999/06/20}{AO: remove duplicates}
\changes{4.0b}{1999/06/20}{call \cs{print@floats}}
\changes{4.0b}{1999/06/20}{Defer assignment until \cs{AtBeginDocument} time.}
\changes{4.0b}{1999/06/20}{Defer decision until \cs{AtBeginDocument} time}
\changes{4.0b}{1999/06/20}{Define three separate environments, defer assignment to \cs{AtBeginD
\changes{4.0b}{1999/06/20}{Frank Mittelbach, has stated in \protect\classname{multicol}: ``The
\changes{4.0b}{1999/06/20}{Move this ``complex'' option to the front, where it can be overridde
\changes{4.0b}{1999/06/20}{New option}
\changes{4.0b}{1999/06/20}{One-line caption sets flush left.}
\changes{4.0b}{1999/06/20}{only execute if appropriate}
\changes{4.0b}{1999/06/20}{Processing delayed to \cs{AtBeginDocument} time}
\changes{4.0b}{1999/06/20}{Removed invocation of nonexistent class option \protect\classoption{
\changes{4.0b}{1999/06/20}{Restore all media size class option of \protect\file{classes.dtx}}
\changes{4.0b}{1999/06/20}{Stack \cs{preprint} args flush right at right margin.}
\changes{4.0c}{1999/11/13}{(AO, 115) If three or more preprints specified, set on single line,
\changes{4.0c}{1999/11/13}{(AO, 129) section* within appendix was producing appendixname}
\changes{4.0c}{1999/11/13}{*-form mandates pagebreak}
\changes{4.0c}{1999/11/13}{also spelled ``acknowledgements''.}
\changes{4.0c}{1999/11/13}{Do not put by REVTeX in every page foot}
\changes{4.0c}{1999/11/13}{grid changes via ltxgrid procedures}
```

```
\changes{4.0c}{1999/11/13}{grid changes with ltxgrid}
\changes{4.0c}{1999/11/13}{Insert procedure \cs{checkindate}}
\changes{4.0c}{1999/11/13}{Lose compatability mode.}
\changes{4.0c}{1999/11/13}{New ltxgrid-based  code, other bug fixes}
\changes{4.0c}{1999/11/13}{New option ``checkin''}
\changes{4.0c}{1999/11/13}{Prevent an inner footnote from performing twice}
\changes{4.0d}{2000/04/10}{Also alter how lists get indented.}
\changes{4.0d}{2000/04/10}{eprint takes an optional argument, syntactical only in this case.}
\changes{4.0d}{2000/04/10}{New option}
\changes{4.0d}{2000/05/10}{More features and bug fixes: compatability with longtable and array
\changes{4.0d}{2000/05/17}{make longtable trigger the head, too}
\changes{4.0d}{2000/05/18}{But alternative spelling is deprecated.}
\changes{4.0e}{2000/09/20}{New option showkeys}
\changes{4.0e}{2000/11/14}{Bug fixes and minor new features: title block affiliations can have
\changes{4.0e}{2000/11/21}{adornments above and below.}
\changes{4.0f}{2001/02/13}{Last bug fixes before release.}
\changes{4.0rc1}{2001/06/17}{Running headers always as if two-sided}
\changes{4.0rc1}{2001/06/18}{grid changes with push and pop}
\changes{4.0rc1}{2001/06/18}{grid changes with push and pop}
\changes{4.0rc4}{2001/07/23}{hyperref is no longer loaded via class option: use a usepackage st
\changes{4.1a}{2008/01/18}{(AO, 457) Endnotes to be sorted in with numerical citations.}%
\changes{4.1a}{2008/01/18}{(AO, 451) ``Cannot have more than 256 cites in a document''}%
\changes{4.1a}{2008/01/18}{(AO, 457) Endnotes to be sorted in with numerical citations.}%
\changes{4.1a}{2008/01/18}{(AO, 460) ``Proper style is "FIG. 1. ..." (no colon)''}%
\changes{4.1a}{2008/01/18}{(AO, 478) \cs{ds@letterpaper}, so that ``letterpaper really is the d
\changes{4.1a}{2008/01/18}{(AO, 488) Change processing of options to allow an unused option to
\changes{4.1a}{2008/01/19}{(AO, 461) Change the csname revtex uses from @dotsep to ltxu@dotsep.
\changes{4.1a}{2008/01/19}{For natbib versions before 8.21, \cs{NAT@sort} was consulted only as
\changes{4.1b}{2008/05/29}{The csname substyle@ext is now defined without a dot (.), to be comp
\changes{4.1b}{2008/06/01}{(AO) Implement bibnotes through \cs{frontmatter@footnote@produce} in
\changes{4.1b}{2008/06/01}{Add option reprint, opposite of preprint, and preferred alternative
\changes{4.1b}{2008/06/29}{(AO, 455) Be nice to a list within the abstract (assign \cs{@totalle
\changes{4.1b}{2008/06/30}{(AO) Structure the Abstract using the \texttt{bibliography} environm
\changes{4.1b}{2008/07/01}{(AO) coordinate \cs{if@twoside} with \cs{twoside@sw}}
\changes{4.1b}{2008/07/01}{(AO) make settings at class time instead of deferring them to later.
\changes{4.1b}{2008/07/01}{(AO) No longer need to test \cs{chapter} as of \texttt{natbib} versi
\changes{4.1b}{2008/07/01}{(AO) No longer use \cs{secnumarabic@sw}, instead use \cs{setup@secnu
\changes{4.1b}{2008/07/01}{(AO) Provide more diagnostics when \cs{@society} is assigned.}
\changes{4.1b}{2008/07/01}{(AO) provide option longbibliography}
\changes{4.1b}{2008/07/01}{Add \cs{@hangfroms@section}}
\changes{4.1b}{2008/07/01}{Break out \cs{@caption@fignum@sep}}
\changes{4.1b}{2008/07/01}{Class option galley sets \cs{preprintsty@sw} to false}
\changes{4.1b}{2008/07/01}{Code relating to new syntax for frontmatter has been placed in \file
\changes{4.1b}{2008/07/01}{Package textcase is now simply a required package}
\changes{4.1b}{2008/07/01}{Procedures \cs{@parse@class@options@society} and \cs{@parse@class@op
\changes{4.1b}{2008/07/01}{Read in all required packages together}
\changes{4.1b}{2008/07/01}{Remove options newabstract and oldabstract}
\changes{4.1b}{2008/08/01}{Section numbering via procedures \cs{secnums@rtx} and \cs{secnums@ar
\changes{4.1b}{2008/08/04}{As with author formatting, rag the right more, and assign \cs{@total
\changes{4.1b}{2008/08/04}{Rag the right even more: .8\cs{hsize}. Also, assign \cs{@totalleftma
```

```
\changes{4.1b}{2008/08/04}{The \texttt{rmp} journal substyle selects \texttt{groupedaddress} by
\changes{4.1b}{2008/08/04}{Use \cs{setup@hook} to initialize all.}
\changes{4.1c}{2008/08/15}{Document class option longbibliography via \cs{substyle@post}}
\changes{4.1d}{2009/03/27}{Definition of \cs{ @fnsymbol} follows fixltx2e.sty}
\changes{4.1e}{2008/06/29}{(AO, 455) be nice to a list within the abstract}
\changes{4.1f}{2009/07/07}{(AO, 513) Add class option linenumbers: number the lines a la \class
\changes{4.1f}{2009/07/07}{(AO, 516) Merged references are separated with a semicolon}
\changes{4.1f}{2009/07/10}{(AO, 520) Automatically produce \cs{bibliography} command when neede
\changes{4.1f}{2009/07/11}{(AO, 521) Lonely bibliography head}%
\changes{4.1f}{2009/07/11}{(AO, 522) Warn if software is expired}%
\changes{4.1f}{2009/07/15}{(AO, 523) Add class option nomerge, to turn off new natbib 8.3 synta
\changes{4.1f}{2009/07/20}{(AO, 524) Makes no sense if citations are superscript numbers and so
\changes{4.1f}{2009/10/05}{(AO, 530) \cs{@fnsymbol}: Failed to import fixltx2e.sty technology.
\changes{4.1g}{2009/10/07}{(AO, 525) Remove phantom paragraph above display math that is given
\changes{4.1g}{2009/10/07}{(AO, 538) \cs{MakeTextUppercase} inappropriately expands the double
\changes{4.1h}{2009/10/09}{(AO) Remove expiry code in the release software}%
\changes{4.1i}{2009/10/23}{(AO, 541) Defer assignment of \cs{cite} until after natbib loads}
\changes{4.1j}{2009/10/24}{(AO, 549) Repairing natbib's \cs{BibitemShut} and \cs{bibAnnote}}
\changes{4.1j}{2009/10/25}{(AO, 545) hypertext capabilities off by default; enable with \classo
\changes{4.1j}{2009/10/25}{(AO, 552) Repair spacing in \cs{onlinecite}}
\changes{4.1k}{2009/11/06}{(AO, 554) give the \cs{newlabel} command syntax appropriate to the h
\changes{4.1n}{2009/11/06}{(AO, 565) restore 4.0 behavior: invoking class option preprint impli
\changes{4.1n}{2009/11/30}{(AO, 566) restore 4.0 behavior: flush column bottoms}
\changes{4.1n}{2009/12/05}{(AO, 569) Use of \classname{hyperref} interferes with column balanci
\changes{4.1n}{2009/12/09}{(AO, 569) execute the after-last-shipout procedures from within the
\changes{4.1n}{2010/01/02}{(AO, 571) Interface \cs{set@footnotewidth} for determining the set w
\changes{4.1n}{2010/01/02}{(AO, 572) Independent footnote counter for title block. Abstract foo
\changes{4.1n}{2009/12/13}{(AO, 573) arrange to load \classname{lineno} after any other package
\changes{4.1n}{2010/01/04}{(AO, 575) the default for journal prstper is longbibliography}%
\changes{4.1n}{2010/01/04}{(AO, 576) In .bst files, remove support for the annote field}%
\changes{4.1n}{2010/01/02}{(AO) fine-tune spacing above and below widetext}%
\changes{4.1n}{2010/01/02}{(AO, 571) class file must set \cs{splittopskip}; fine tune \cs{skip}
\changes{4.1n}{2010/01/02}{(AO, 572) \cs{@makefntext} and \cs{frontmatter@makefntext} must be d
\changes{4.1o}{2010/02/02}{(AO, 575) Automatically incorporate the (Bib\TeX-generated) .bbl int
\changes{4.1o}{2010/02/05}{(AO, 549) Remove patch to natbib, which is now at version 8.31a}
\changes{4.1o}{2010/02/07}{(AO, 578) accommodate the possible space character preceding \cs{Bib
\changes{4.1o}{2010/02/05}{(AO, 579) Endnote shall comprise their own Bib\TeX\ entry type: @FOO
\changes{4.1o}{2010/02/10}{(AO, 580) Provide a document class option to turn off production of
\changes{4.1o}{2010/02/12}{(AO, 580) Control .bst at run time.}%
\changes{4.1o}{2010/02/09}{(AO, 581) Handle case: merged references, with first ending in a sto
\changes{4.1p}{2010/02/24}{(AO, 583) Provide interface to \classname{ltxgrid} \cs{onecolumn@gri
\changes{4.1p}{2010/02/24}{(AO, 584) Per MD, remove trailing space character from each journal
\changes{4.1q}{2010/04/01}{(AO, 586) When .bbl is pasted into the document, prevent automatic b
\changes{4.1q}{2010/04/13}{(AO, 588) Only write \revtex-specific BibTeX .bib data if the .bst s
\changes{4.1r}{2010/06/22}{(AO, 595) Provide \cs{lovname} along with other List of Videos defin
\changes{4.2a}{2014/12/31}{(Aptara, MD) Added initial support for SOR and AAPM journals, additi
\changes{4.2a}{2014/12/31}{(Aptara) Make prb style to follow other Phys. Rev. journals.}%
\changes{4.2a}{2014/12/31}{(Aptara) Corrected indentation for tableofcontents appearing along w
\changes{4.2a}{2017/11/21}{(MD) Make long bibliography style the default now.}%
\changes{4.2a}{2017/11/28}{(MD) Add call to normalsize to be a good citizen and allow booktabs.
```

```
\changes{4.2b}{2018/12/26}{(MD) Make titles in bibliography default, prb style to follow other
\changes{4.2b}{2017/11/21}{(MD) Update options for new titles without "Special Topics" and make
\changes{4.2b}{2017/11/21}{(MD) Add options for new APS journals and a generic physrev option f
\changes{4.2b}{2017/11/22}{(MD) Change default to not use a title page - it seems antiquated}%
\changes{4.2b}{2017/11/22}{(MD) MD - not sure why these parameters were different previously. M
\changes{4.2b}{2017/11/22}{(MD) PACS are obsolete altogether now}%
\changes{4.2b}{2018/12/26}{(MD) Improve control over display of e-print ids in bibliography.}%

\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.

```
%%\newcommand\revtex{REV\TeX}% TeXSupport
\begin{document}%
\expandafter\DocInput\expandafter{\jobname.dtx}%
\PrintChanges
\end{document}
```

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

```
%</doc>
```

4 Overview

REVTEX is a LATEX 2_ε 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:

REVTEX option	**package**
`amsfonts`	`amsfonts`
`amssymb`	`amssymb`
`aps`	`overcite`

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 LATEX'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 indicateded 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 LATEX will now execute the `\AtEndOfClass` procedures.

REVTEX will have enqueued code to execute at `\AtBeginDocument` time, in two different queues. `\document@inithook` executes immediately upon encountering the `\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-specifc 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 LaTeX definition of `\ProvidesPackage` and 2) that the line of code immediately afterwards follows the `\ProvidesClass` statement above.

```
%<*kernel>
```

Print a banner in the log:

```
\GenericInfo{}{\space
 Copyright (c) 2019 American Physical Society.^^J
 mailto:revtex@aps.org^^J
 Licensed under the LPPL:^^Jhttp://www.ctan.org/tex-archive/macros/latex/base/lppl.txt^^J
 Arthur Ogawa <arthur_ogawa at sbcglobal dot net>^^J
 Based on work by David Carlisle <david at dcarlisle.demon.co.uk>^^J
 Version (4.2d,4.2e): Modified by Mark Doyle and Phelype Oleinik^^J
 \@gobble
}%
```

6.1 Compatibility Processing

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

```
\if@compatibility
  \edef\reserved@a{\errhelp{%
   Change your \string\documentstyle\space statement to
   \string\documentclass\space and rerun.
  }}\reserved@a
  \errmessage{You cannot run \class@name\space in compatability mode}%
  \expandafter\@@end
\fi
```

7 Extensions to the LaTeX Kernel

```
%</kernel>
```

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

Here begins the `options` DOCSTRIP module.

```
%<*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.

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

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

```
\appdef\document@inithook{%
 \switch@longtable
 \let\LT@makecaption\LT@makecaption@rtx
}%
```

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

```
\def\LT@makecaption@rtx#1#2#3{%
  \LT@mcol\LT@cols c{%
    \hbox to\z@{%
     \hss
     \parbox[t]\LTcapwidth{%
      \sbox\@tempboxa{#1{#2: }#3\unskip\nobreak\vrule\@width\z@\@height\z@\@depth .5\baselinesk
      \ifdim\wd\@tempboxa>\hsize
        #1{#2: }#3\unskip\nobreak\vrule\@width\z@\@height\z@\@depth .5\baselineskip
      \else
        \hbox to\hsize{\hfil\box\@tempboxa\hfil}%
      \fi
      \endgraf
     }%
     \hss
    }%
  }%
}%
```

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

```
\def\protectdef@boldmath{%
 \expandafter\@ifnotrelax\csname boldmath \endcsname{}{%
  \class@info{Robustifying \string\LaTeX's \string\boldmath\space command}%
  \expandafter\let\csname boldmath \endcsname\boldmath
  \expandafter\def\expandafter\boldmath\expandafter{\expandafter\protect\csname boldmath \endcs
 }%
}%
\appdef\document@inithook{%
 \protectdef@boldmath
}%
```

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 REVTeX 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 LaTeX parameters (resp. TeX 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.)

```
\DeclareOption{checkin}{%
  \@booleantrue\dateinRH@sw
  \@booleantrue\preprintsty@sw
  \def\@pointsize{12}%
  \@booleantrue\showPACS@sw
  \@booleantrue\showKEYS@sw
  \def\fp@proc@h{\allow@breaking@tables}%
  \def\fp@proc@H{\allow@breaking@tables}%
}%
\@booleanfalse\dateinRH@sw
\def\checkindate{\dateinRH@sw{{\tiny(\today)}}{}}%
\def\allow@breaking@tables{%
 \def\array@default{v}% tabular can break over pages
 \@booleanfalse\floats@sw % table can break over pages
}%
```

9.2.2 Preprint Style

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

```
\DeclareOption{preprint}{%
 \@booleantrue\preprintsty@sw
 \ExecuteOptions{12pt}%
}%
\DeclareOption{reprint}{%
\@booleanfalse\preprintsty@sw
\@booleantrue\twocolumn@sw
 \ExecuteOptions{10pt}%
}%
\DeclareOption{manuscript}{%
 \class@warn{Document class option manuscript is obsolete; use preprint instead}%
 \ExecuteOptions{preprint}%
}%
\@booleanfalse\preprintsty@sw
```

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

9.2.3 Showing PACS and keywords

```
\DeclareOption{showpacs}{%
  \@booleantrue\showPACS@sw
}%
\DeclareOption{noshowpacs}{%
  \@booleanfalse\showPACS@sw
}%
\DeclareOption{showkeys}{%
  \@booleantrue\showKEYS@sw
}%
\DeclareOption{noshowkeys}{%
  \@booleanfalse\showKEYS@sw
}%
\@booleanfalse\showPACS@sw
\@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.

```
\DeclareOption{balancelastpage}{%
  \@booleantrue\balancelastpage@sw
}%
\DeclareOption{nobalancelastpage}{%
  \@booleanfalse\balancelastpage@sw
```

```
}%
\@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.

```
\DeclareOption{nopreprintnumbers}{\@booleanfalse\preprint@sw}%
\DeclareOption{preprintnumbers}{\@booleantrue\preprint@sw}%
\appdef\setup@hook{%
 \@ifxundefined\preprint@sw{\let\preprint@sw\preprintsty@sw}{}%
}%
```

9.2.6 Hypertext Option

```
\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.

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

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.

```
\DeclareOption{10pt}{\def\@pointsize{10}}%
```

```
\DeclareOption{11pt}{\def\@pointsize{11}}%
\DeclareOption{12pt}{\def\@pointsize{12}}%
\let\@pointsize\@undefined
```

9.2.8 Media Size

\paperheight
\paperwidth

```
\DeclareOption{a4paper}{%
    \setlength\paperheight {297mm}%
    \setlength\paperwidth  {210mm}%
}%
\DeclareOption{a5paper}{%
    \setlength\paperheight {210mm}%
    \setlength\paperwidth  {148mm}%
}%
\DeclareOption{b5paper}{%
    \setlength\paperheight {250mm}%
    \setlength\paperwidth  {176mm}%
}%
\DeclareOption{letterpaper}{%
    \setlength\paperheight {11in}%
    \setlength\paperwidth  {8.5in}%
}%
\DeclareOption{legalpaper}{%
    \setlength\paperheight {14in}%
    \setlength\paperwidth  {8.5in}%
}%
\DeclareOption{executivepaper}{%
    \setlength\paperheight {10.5in}%
    \setlength\paperwidth  {7.25in}%
}%
\DeclareOption{landscape}{%
    \setlength\@tempdima   {\paperheight}%
    \setlength\paperheight {\paperwidth}%
    \setlength\paperwidth  {\@tempdima}%
}%
```

Effectively select `letterpaper`.

```
\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.

```
\DeclareOption{bibnotes}{\let\frontmatter@footnote@produce\frontmatter@footnote@produce@endnote
\DeclareOption{nobibnotes}{\let\frontmatter@footnote@produce\frontmatter@footnote@produce@footn
```

```
\let\frontmatter@footnote@produce\frontmatter@footnote@produce@footnote
\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.

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

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

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

9.2.11 altaffilletter

\altaffilletter@sw

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

```
\DeclareOption{altaffilletter}{\@booleantrue\altaffilletter@sw}%
\DeclareOption{altaffilsymbol}{\@booleanfalse\altaffilletter@sw}%
\@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.

```
\DeclareOption{superbib}{%
 \let\place@bibnumber\place@bibnumber@sup
}%
\def\place@bibnumber{\NATx@bibnumfmt}%
```

\place@bibnumber@sup
\place@bibnumber@inl

For producing the `\bibitem` device, we define two procedures to select from.

Note that we could have used `natbib`'s `\ifNAT@super` switch, but it does not allow for altering the meaning of `\bibnumfmt`.

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

9.2.13 citeautoscript

\citeautoscript@sw

This class option allows you to automatically accomodate a change from non-superscripted, numbered references to superscripted, bunmbered 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.

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

9.2.14 Variants on the Bibliography Style

REVTEX anticipates that a society or journal will provide two related BibTEXbibliography 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` REVTEX's default for `\longbibliography@sw` is `\true@sw`.

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

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

```
\DeclareOption{eprint}{\@booleantrue\eprint@enable@sw}%
\DeclareOption{noeprint}{\@booleanfalse\eprint@enable@sw}%
\@booleantrue\eprint@enable@sw
```

9.2.15 Simplex/Duplex Pages

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

```
\@booleanfalse\twoside@sw
\appdef\document@inithook{%
 \twoside@sw{\@twosidetrue}{\@twosidefalse}%
}%
```

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).

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

9.2.16 Two-Column Page Grid

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

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

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

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

```
\def\select@column@grid{%
 \twocolumn@sw{%
  \twocolumn@grid@setup
  \open@twocolumn
 }{%
  \onecolumn@grid@setup

 % \open@onecolumn
 %

 }%
}%
\appdef\class@documenthook{%
 \select@column@grid
}%
```

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

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

```
\appdef\setup@hook{%
 \let\clearpage@ltx\clearpage
 \prepdef\clear@document{\let\clearpage\clearpage@ltx\let\clear@document\@empty\close@column}%
 \appdef\class@documenthook{%
  \appdef\class@enddocumenthook{%
   \let\clearpage\clear@document
  }%
 }%
}%
```

`\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` selectes "numerical" citations. The former is the default.

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

```
\DeclareOption{galley}{%
  \ExecuteOptions{onecolumn}%
  \@booleantrue\galley@sw
  \@booleanfalse\preprintsty@sw
  \appdef\setup@hook{%
    \advance\textwidth-\columnsep
    \textwidth.5\textwidth
  }%
}%
\@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.

```
\DeclareOption{raggedbottom}{\@booleantrue\raggedcolumn@sw}
\DeclareOption{flushbottom}{\@booleanfalse\raggedcolumn@sw}
\@booleanfalse\raggedcolumn@sw
\appdef\setup@hook{%
 \raggedcolumn@sw{\raggedbottom}{\flushbottom}%
}%
```

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.

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

```
\@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.

```
\DeclareOption{lengthcheck}{%
 \@booleantrue\lengthcheck@sw
 \ExecuteOptions{reprint}%
}%
```

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

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

9.2.20 Draft and Final

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

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

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

```
\DeclareOption{draft}{\@booleantrue\draft@sw}%
\DeclareOption{final}{\@booleanfalse\draft@sw}%
\@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)".

```
\appdef\setup@hook{%
 \eqsecnum@sw{%
  \@addtoreset{equation}{section}%
  \def\theequation@prefix{\arabic{section}.}%
 }{}%
}%
```

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

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

```
\appdef\setup@hook{%
 \setup@secnums
}%
\DeclareOption{secnumarabic}{%
 \def\setup@secnums{\secnums@arabic}%
}%
\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`.

```
\DeclareOption{fleqn}{%
 \input{fleqn.clo}%
}%
```

9.2.23 floats/endfloats

`\floats@sw` `\floatp@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.

```
\DeclareOption{floats}{\@booleantrue\floats@sw\@booleanfalse\floatp@sw}
\DeclareOption{endfloats}{\@booleanfalse\floats@sw\@booleanfalse\floatp@sw}
\DeclareOption{endfloats*}{\@booleanfalse\floats@sw\@booleantrue\floatp@sw}
\@booleantrue\floats@sw
\@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.

```
\DeclareOption{titlepage}{\@booleantrue\titlepage@sw}
\DeclareOption{notitlepage}{\@booleanfalse\titlepage@sw}
\@booleanfalse\titlepage@sw
```

9.2.25 Substyle and Sub-substyle

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

```
\def\change@society#1{%
 \def\@tempa{#1}%
 \@ifxundefined\@society{%
  \class@info{Selecting society \@tempa}%
  \let\@society\@tempa
 }{%
  \@ifx{\@tempa\@society}{}{%
   \class@warn{Conflicting society \@tempa<>\@society; not selected}%
  }%
 }%
}%
\def\change@journal#1{%
 \def\@tempa{#1}%
 \@ifxundefined\@journal{%
  \class@info{Selecting journal \@tempa}%
  \let\@journal\@tempa
 }{%
  \@ifx{\@tempa\@journal}{}{%
   \class@warn{Conflicting journal \@tempa<>\@journal; not selected}%
  }%
 }%
}%
```

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.

```
\DeclareOption{osa}{\change@society{osa}\let\@journal\@undefined}%
\DeclareOption{osameet}{\change@society{osa}\def\@journal{osameet}}%
\DeclareOption{opex}{\change@society{osa}\def\@journal{opex}}%
\DeclareOption{tops}{\change@society{osa}\def\@journal{tops}}%
\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.

```
\let\rtx@require@packages\@empty
```

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

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

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.

```
\DeclareOption{amsfonts}{%
  \def\class@amsfonts{\RequirePackage{amsfonts}}%
}%
\DeclareOption{noamsfonts}{%
  \let\class@amsfonts\@empty
}%
\appdef\rtx@require@packages{%
 \@ifxundefined\class@amsfonts{}{\class@amsfonts}%
}%
```

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

```
\DeclareOption{amssymb}{%
  \def\class@amssymb{\RequirePackage{amssymb}}%
}%
\DeclareOption{noamssymb}{%
  \let\class@amssymb\@empty
}%
\appdef\rtx@require@packages{%
 \@ifxundefined\class@amssymb{}{\class@amssymb}%
}%
```

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

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

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

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.

```
\DeclareOption{amsmath}{%
  \def\class@amsmath{\RequirePackage{amsmath}[\ver@amsmath@prefer]}%
}%
\DeclareOption{noamsmath}{%
  \let\class@amsmath\@empty
}%
\appdef\rtx@require@packages{%
 \preserve@LaTeX
 \@ifxundefined\class@amsmath{}{\class@amsmath}%
 \appdef\class@enddocumenthook{\test@amsmath@ver}%
}%
\appdef\preserve@LaTeX{%
 \let\@ifl@aded@LaTeX\@ifl@aded
 \let\@ifpackageloaded@LaTeX\@ifpackageloaded
 \let\@pkgextension@LaTeX\@pkgextension
 \let\@ifpackagelater@LaTeX\@ifpackagelater
 \let\@ifl@ter@LaTeX\@ifl@ter
 \let\@ifl@t@r@LaTeX\@ifl@t@r
 \let\@parse@version@LaTeX\@parse@version
}%
\appdef\restore@LaTeX{%
 \let\@ifl@aded\@ifl@aded@LaTeX
 \let\@ifpackageloaded\@ifpackageloaded@LaTeX
 \let\@pkgextension\@pkgextension@LaTeX
 \let\@ifpackagelater\@ifpackagelater@LaTeX
 \let\@ifl@ter\@ifl@ter@LaTeX
 \let\@ifl@t@r\@ifl@t@r@LaTeX
 \let\@parse@version\@parse@version@LaTeX
}%
\def\test@amsmath@ver{%
 \begingroup
  \restore@LaTeX
  \@ifpackageloaded{amsmath}{%
   \@ifpackagelater{amsmath}{\ver@amsmath@prefer}{}{%
     \class@warn{%
      You have loaded amsmath, version "\csname ver@amsmath.sty\endcsname",\MessageBreak
      but this class requires version "\ver@amsmath@prefer", or later.\MessageBreak
      Please update your LaTeX installation.
     }%
```

```
   }%
  }{%
  }%
 \endgroup
}%
\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.

```
\DeclareOption{byrevtex}{\@booleantrue\byrevtex@sw}%
\@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 LATEX'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 LATEX extension. If not, a helpful message is printed in the log, indicating how to work around the difficulty.

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

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

```
\gdef\@fltovf{%
 \@latex@error{%
  Too many unprocessed floats%
  \force@deferlist@sw{}{; try class option [floatfix]}%
 }\@ehb
}%
\def\@fltstk{%
 \@latex@warning{%
  A float is stuck (cannot be placed)%
  \force@deferlist@sw{}{; try class option [floatfix]}%
 }%
}%
```

\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.

```
\DeclareOption{ltxgridinfo}{%
 \@booleantrue\ltxgrid@info@sw
%\@booleantrue\ltxgrid@foot@info@sw
}%
\DeclareOption{outputdebug}{%
 \@booleantrue\outputdebug@sw
 \@booleantrue\ltxgrid@info@sw
 \@booleantrue\ltxgrid@foot@info@sw
 \traceoutput
}%
```

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.

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

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

\linenumbers@sw

An option to number the lines of type in the output in the manner of `lineno`.

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

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

```
\DeclareOption{linenumbers}{%
 \appdef
 \class@documenthook{%
  \RequirePackage{lineno}[2005/11/02 v4.41]%
```

```
  \linenumbersep4pt\relax
  \linenumbers\relax
 }%
}%
```

By default, line numbering is off.

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

```
\DeclareOption{nomerge}{%
 \appdef\setup@hook{%
  \@ifnum{\NAT@merge>\z@}{\let\NAT@merge\z@}{}%
 }%
}%
```

9.7 Default Option, Society, Journal, and pointsize

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

`\@parse@class@options@society` `\@parse@class@options@` 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 `\@ptionlist{\@currname.\@currext}`. 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.

```
\def\@parse@class@options@society{%
 \edef\@tempa{\@ptionlist{\@currname.\@currext}}%
 \expandafter\@for\expandafter\CurrentOption\expandafter:\expandafter=\@tempa\do{%
  \expandafter\@ifnotrelax\csname ds@\CurrentOption\endcsname{}{%
   \IfFileExists{\CurrentOption\substyle@post.\substyle@ext}{%
    \expandafter\change@society\expandafter{\CurrentOption}%
    \expandafter\let\csname ds@\CurrentOption\endcsname\@empty
   }{}%
  }%
 }%
}%
\def\@parse@class@options@#1{%
 \edef\@tempa{\@ptionlist{\@currname.\@currext}}%
 \expandafter\@for\expandafter\CurrentOption\expandafter:\expandafter=\@tempa\do{%
  \expandafter\@ifnotrelax\csname ds@\CurrentOption\endcsname{%
   \begingroup\csname ds@\CurrentOption\endcsname
    \@ifxundefined#1{%
     \endgroup
    }{%
```

```
     \expandafter\endgroup\expandafter\def\expandafter#1\expandafter{#1}%
    }%
  }{}%
 }%
}%
\def\@parse@class@options@journal{%
 \edef\@tempa{\@ptionlist{\@currname.\@currext}}%
 \expandafter\@for\expandafter\CurrentOption\expandafter:\expandafter=\@tempa\do{%
  \expandafter\@ifnotrelax\csname ds@\CurrentOption\endcsname{%
   \begingroup
    \csname ds@\CurrentOption\endcsname
    \@ifxundefined\@journal{%
     \endgroup
    }{%
     \expandafter\endgroup\expandafter\def\expandafter\@journal\expandafter{\@journal}%
    }%
  }{}%
 }%
}%
\def\@parse@class@options{%
 \edef\@tempa{\@ptionlist{\@currname.\@currext}}%
 \expandafter\@for\expandafter\CurrentOption\expandafter:\expandafter=\@tempa\do{%
  \expandafter\@ifnotrelax\csname ds@\CurrentOption\endcsname{%
   \begingroup
    \csname ds@\CurrentOption\endcsname
    \@ifxundefined\@pointsize{%
     \endgroup
    }{%
     \expandafter\endgroup\expandafter\def\expandafter\@pointsize\expandafter{\@pointsize}%
    }%
  }{%
   \IfFileExists{\CurrentOption\substyle@post.\substyle@ext}{%
    \expandafter\change@society\expandafter{\CurrentOption}%
    \expandafter\let\csname ds@\CurrentOption\endcsname\@empty
   }{}%
  }%
 }%
}%
```

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

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

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

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

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

(This behavior is similar to the LaTeX2.09 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`.

```
%</options>
%<*package>
```

\@process@society
\@process@journal
\@process@pointsize

```
\def\substyle@post{4-2}%
\def\substyle@ext{rtx}%
\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.

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

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

```
\def\@process@journal#1{%
 \@ifxundefined\@journal{%
  \class@warn{No journal specified, using default #1}%
  \def\@journal{#1}%
 }{}%
 \expandafter\expandafter
 \expandafter\rtx@do@substyle
 \expandafter\expandafter
 \expandafter{\expandafter\@society\@journal}%
}%
\def\rtx@do@substyle#1{%
 \InputIfFileExists{#1\substyle@post.\substyle@ext}{}{\csname rtx@#1\endcsname}%
}%
```

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.

```
\def\@process@pointsize#1{%
 \@ifxundefined\@pointsize{%
  \def\@pointsize{#1}%
  \class@warn{No type size specified, using default \@pointsize}%
 }{}%
 \expandafter\expandafter
 \expandafter\rtx@do@substyle
 \expandafter\expandafter
 \expandafter{\expandafter\@society\@pointsize pt}%
}%
```

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`

```
 \def\ps@headings{%
     \let\@oddfoot\@empty\let\@evenfoot\@empty
     \def\@evenhead{\thepage\hfil\slshape\leftmark}%
     \def\@oddhead{{\slshape\rightmark}\hfil\thepage}%
     \let\@mkboth\markboth
   \def\sectionmark##1{%
     \markboth {\MakeUppercase{%
       \ifnum \c@secnumdepth >\z@
         \thesection\quad
       \fi
       ##1}}{}}%
   \def\subsectionmark##1{%
     \markright {%
       \ifnum \c@secnumdepth >\@ne
         \thesubsection\quad
       \fi
       ##1}}}%
\def\ps@myheadings{%
    \let\@oddfoot\@empty\let\@evenfoot\@empty
    \def\@evenhead{\thepage\hfil\slshape\leftmark}%
    \def\@oddhead{{\slshape\rightmark}\hfil\thepage}%
    \let\@mkboth\@gobbletwo
    \let\sectionmark\@gobble
    \let\subsectionmark\@gobble
```

```
    }%

\ps@article
\ps@article@final
\ps@preprint
\def\ps@article{%
    \def\@evenhead{\let\\\heading@cr\thepage\quad\checkindate\hfil{\leftmark}}%
    \def\@oddhead{\let\\\heading@cr{\rightmark}\hfil\checkindate\quad\thepage}%
    \def\@oddfoot{}%
    \def\@evenfoot{}%
    \let\@mkboth\markboth
  \let\sectionmark\@gobble
  \let\subsectionmark\@gobble
}%
\def\ps@article@final{%
    \def\@evenhead{\let\\\heading@cr\thepage\quad\checkindate\hfil{\leftmark}}%
    \def\@oddhead{\let\\\heading@cr{\rightmark}\hfil\checkindate\quad\thepage}%
    \def\@oddfoot{}%
    \def\@evenfoot{}%
    \let\@mkboth\markboth
    \def\sectionmark##1{%
      \markboth{%
       \MakeTextUppercase{%
        \@ifnum{\c@secnumdepth >\z@}{\thesection\hskip 1em\relax}{}%
         ##1%
       }%
       }{}%
    }%
    \def\subsectionmark##1{%
      \markright {%
        \@ifnum{\c@secnumdepth >\@ne}{\thesubsection\hskip 1em\relax}{}%
         ##1%
      }%
    }%
}%
\def\heading@cr{\unskip\space\ignorespaces}%

\def\ps@preprint{%
  \def\@oddfoot{\hfil\thepage\quad\checkindate\hfil}%
  \def\@evenfoot{\hfil\thepage\quad\checkindate\hfil}%
  \def\@oddhead{}%
  \def\@evenhead{}%
  \let\@mkboth\@gobbletwo
  \let\sectionmark\@gobble
  \let\subsectionmark\@gobble
}%

\let\@oddhead\@empty
\let\@evenhead\@empty
\let\@oddfoot\@empty
\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 with code optimised slightly.

```
\def\lastpage@putlabel{%
 \if@filesw
  \begingroup
    \advance\c@page\m@ne
    \immediate\write\@auxout{\string\newlabel{LastPage}{{}{\thepage}{}{}{}}}%
  \endgroup
 \fi
}%
```

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

```
\appdef\clear@document{%
 \do@output@cclv{%
  \lastpage@putlabel
  \tally@box@size@sw{\total@text}{}%
 }%
}%
\providecommand\write@column@totals{}%
```

11 Required Packages

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

```
\appdef\rtx@require@packages{%
 \RequirePackage{url}%
}%
```

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`.

```
\appdef\document@inithook{%
 \incompatible@package{cite}%
 \incompatible@package{mcite}%
 \incompatible@package{multicol}%
}%
```

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.

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

```
\def\labelenumi{\theenumi.}
\def\theenumi{\arabic{enumi}}

\def\labelenumii{(\theenumii)}
\def\theenumii{\alph{enumii}}
\def\p@enumii{\theenumi}

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

\def\labelenumiv{\theenumiv.}
\def\theenumiv{\Alph{enumiv}}
\def\p@enumiv{\p@enumiii\theenumiii}

\def\labelitemi{\textbullet}
\def\labelitemii{\normalfont\bfseries\textendash}
\def\labelitemiii{\textasteriskcentered}
\def\labelitemiv{\textperiodcentered}

\pagenumbering{arabic}
```

14.2 float parameters

from the old aps.sty. (DPC: same as article I think) AO: here, LaTeX'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.

```
\setcounter{topnumber}{2}
\def\topfraction{.9}
\setcounter{bottomnumber}{1}
\def\bottomfraction{.9}
\setcounter{totalnumber}{3}
\def\textfraction{.1}
\def\floatpagefraction{.9}
\setcounter{dbltopnumber}{2}
\def\dbltopfraction{.9}
\def\dblfloatpagefraction{.9}
```

14.3 List Environments

```
\newenvironment{verse}{%
  \let\\=\@centercr
  \list{}{%
    \itemsep\z@ \itemindent -1.5em\listparindent \itemindent
    \rightmargin\leftmargin\advance\leftmargin 1.5em}\item[]%
}{%
```

```
 \endlist
}%
\newenvironment{quotation}{%
  \list{}{%
    \listparindent 1.5em
    \itemindent\listparindent
    \rightmargin\leftmargin \parsep \z@ \@plus\p@}\item[]%
}{%
 \endlist
}%
\newenvironment{quote}{%
  \list{}{%
  \rightmargin\leftmargin}\item[]%
}{%
 \endlist
}%
\def\descriptionlabel#1{%
  \hspace\labelsep \normalfont\bfseries #1\unskip:%
}%
\newenvironment{description}{%
 \list{}{%
    \labelwidth\z@ \itemindent-\leftmargin
    \let\makelabel\descriptionlabel
 }%
}{%
 \endlist
}%
```

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.

```
\newcounter{part}%
\let\thepart\@undefined
\newcounter{section}%
\let\thesection\@undefined
\newcounter{subsection}[section]%
\let\thesubsection\@undefined
\newcounter{subsubsection}[subsection]%
\let\thesubsubsection\@undefined
\newcounter{paragraph}[subsubsection]%
\let\theparagraph\@undefined
\newcounter{subparagraph}[paragraph]%
\let\thesubparagraph\@undefined
```

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

\secnums@rtx
\secnums@arabic

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.

```
\def\secnums@rtx{%
 \@ifxundefined\thepart{%
  \def\thepart{\Roman{part}}%
 }{}%
 \@ifxundefined\thesection{%
  \def\thesection       {\Roman{section}}%
  \def\p@section        {}%
 }{}%
 \@ifxundefined\thesubsection{%
  \def\thesubsection    {\Alph{subsection}}%
  \def\p@subsection     {\thesection\,}%
 }{}%
 \@ifxundefined\thesubsubsection{%
  \def\thesubsubsection {\arabic{subsubsection}}%
  \def\p@subsubsection  {\thesection\,\thesubsection\,}%
 }{}%
 \@ifxundefined\theparagraph{%
  \def\theparagraph     {\alph{paragraph}}%
  \def\p@paragraph      {\thesection\,\thesubsection\,\thesubsubsection\,}%
 }{}%
 \@ifxundefined\thesubparagraph{%
  \def\thesubparagraph  {\arabic{subparagraph}}%
  \def\p@subparagraph   {\thesection\,\thesubsection\,\thesubsubsection\,\theparagraph\,}%
 }{}%
}%
\def\secnums@arabic{%
 \@ifxundefined\thepart{%
  \def\thepart          {\Roman{part}}%
 }{}%
 \@ifxundefined\thesection{%
  \def\thesection       {\Roman{section}}%
  \def\p@section        {}%
 }{}%
 \@ifxundefined\thesubsection{%
  \def\thesubsection    {\thesection.\arabic{subsection}}%
  \def\p@subsection     {}%
 }{}%
 \@ifxundefined\thesubsubsection{%
  \def\thesubsubsection {\thesubsection.\arabic{subsubsection}}%
  \def\p@subsubsection  {}%
 }{}%
 \@ifxundefined\theparagraph{%
  \def\theparagraph     {\thesubsubsection.\arabic{paragraph}}%
  \def\p@paragraph      {}%
 }{}%
 \@ifxundefined\thesubparagraph{%
  \def\thesubparagraph  {\theparagraph.\arabic{subparagraph}}%
```

```
  \def\p@subparagraph   {}%
 }{}%
}%
```

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`.

```
\newenvironment{acknowledgments}{%
 \acknowledgments@sw{%
  \expandafter\section\expandafter*\expandafter{\acknowledgmentsname}%
 }{%
  \par
  \phantomsection
  \addcontentsline{toc}{section}{\protect\numberline{}\acknowledgmentsname}%
 }%
}{%
 \par
}%
\@booleantrue\acknowledgments@sw
\newenvironment{acknowledgements}{%
 \replace@environment{acknowledgements}{acknowledgments}%
}{%
 \endacknowledgments
}%
```

14.4.3 Part Opener

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

```
\def\part{\par
   \addvspace{4ex}%
   \@afterindentfalse
   \secdef\@part\@spart}%

\def\@part[#1]#2{%
 \@ifnum{\c@secnumdepth >\m@ne}{%
        \refstepcounter{part}%
        \addcontentsline{toc}{part}{\thepart\hspace{1em}#1}%
 }{%
      \addcontentsline{toc}{part}{#1}%
 }%
 \begingroup
    \parindent \z@ \raggedright
    \interlinepenalty\@M
    \@ifnum{\c@secnumdepth >\m@ne}{%
```

```
      \Large \bf \partname~\thepart%
      \par\nobreak
    }{}%
    \huge \bf
    #2%
    \markboth{}{}\par
 \endgroup
   \nobreak
   \vskip 3ex
   \@afterheading
}%
\def\@spart#1{{\parindent \z@ \raggedright
    \interlinepenalty\@M
    \huge \bf
    #1\par}
    \nobreak
    \vskip 3ex
    \@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`.

```
\def\section{%
  \@startsection
    {section}%
    {1}%
    {\z@}%
    {0.8cm \@plus1ex \@minus .2ex}%
    {0.5cm}%
    {\normalfont\small\bfseries}%
}%
\def\subsection{%
  \@startsection
    {subsection}%
    {2}%
    {\z@}%
    {.8cm \@plus1ex \@minus .2ex}%
    {.5cm}%
    {\normalfont\small\bfseries}%
}%
\def\subsubsection{%
  \@startsection
    {subsubsection}%
    {3}%
    {\z@}%
```

```
    {.8cm \@plus1ex \@minus .2ex}%
    {.5cm}%
    {\normalfont\small\itshape}%
}%
```

14.4.5 Runin Heads

```
\def\paragraph{%
  \@startsection
    {paragraph}%
    {4}%
    {\parindent}%
    {\z@}%
    {-1em}%
    {\normalfont\normalsize\itshape}%
}%
\def\subparagraph{%
  \@startsection
    {subparagraph}%
    {5}%
    {\parindent}%
    {3.25ex \@plus1ex \@minus .2ex}%
    {-1em}%
    {\normalfont\normalsize\bfseries}%
}%
```

14.5 Math

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

```
\def\theequation{%
 \theequation@prefix\arabic{equation}%
}%
\def\theequation@prefix{}%
```

14.6 Type Size-Dependent Settings

14.7 All Point Sizes

```
\setcounter{secnumdepth}{4}
\lineskip 1pt
\normallineskip 1pt
\def\baselinestretch{1}%
\@lowpenalty   51
\@medpenalty  151
\@highpenalty 301
\@beginparpenalty -\@lowpenalty
\@endparpenalty   -\@lowpenalty
```

```
\@itempenalty     -\@lowpenalty

\arraycolsep 3pt
\tabcolsep 2pt
\arrayrulewidth .4pt
\doublerulesep 2pt

\skip\@mpfootins = 0pt

\fboxsep  = 3.0pt
\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`.

```
\newenvironment{figure}
               {\@float{figure}}
               {\end@float}
\newenvironment{figure*}
               {\@dblfloat{figure}}
               {\end@dblfloat}

\def\listoffigures{\print@toc{lof}}%
\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.

```
\newlength\abovecaptionskip
\newlength\belowcaptionskip
\setlength\abovecaptionskip{10\p@}
\setlength\belowcaptionskip{2\p@}
```

There is a hook `\@caption@fignum@sep` for determining the separator following 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).

```
\long\def\@makecaption#1#2{%
  \par
% \nobreak
  \vskip\abovecaptionskip
  \begingroup
   \small\rmfamily
   \sbox\@tempboxa{%
    \let\\\heading@cr
    \@make@capt@title{#1}{#2}%
   }%
   \@ifdim{\wd\@tempboxa >\hsize}{%
    \begingroup
     \samepage
     \flushing
     \let\footnote\@footnotemark@gobble
     \@make@capt@title{#1}{#2}\par
    \endgroup
```

```
    }{%
      \global \@minipagefalse
      \hb@xt@\hsize{\hfil\unhbox\@tempboxa\hfil}%
    }%
  \endgroup
  \vskip\belowcaptionskip
}%
\def\@make@capt@title#1#2{%
 \@ifx@empty\float@link{\@firstofone}{\expandafter\href\expandafter{\float@link}}%
  {#1}\@caption@fignum@sep#2%
}%
\def\@footnotemark@gobble{%
 \@footnotemark
 \@ifnextchar[{\@gobble@opt@i}{\@gobble}%
}%
\def\@gobble@opt@i[#1]#2{}%
\def\@mpmakefntext#1{%
 \flushing
 \parindent=1em
 \noindent
 \hb@xt@1em{\hss\@makefnmark}%
 #1%
}%
\def\@caption@fignum@sep{. }%
\def\setfloatlink{\def\float@link}%
\let\float@link\@empty
```

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

```
\newcounter{figure}
\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`.

```
\def\fps@figure{tbp}
\def\ftype@figure{1}
\def\ext@figure{lof}
\def\fnum@figure{\figurename~\thefigure}
```

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

```
\expandafter\newbox\csname fbox@\ftype@figure\endcsname
\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.

```
\appdef\class@documenthook{%
 \do@if@floats{figure}{.fgx}%
```

```
}%
\appdef\class@enddocumenthook{%
 \printfigures\relax
}%
```

`\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.

```
\newcommand\printfigures{%
 \@ifstar{\true@sw}{\floatp@sw{\true@sw}{\false@sw}}%
 {%
  \print@float{figure}{\oneapage}%
 }{%
  \print@float{figure}{}%
 }%
}%
```

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

```
\appdef\@xfloat@prep{%
 \appdef\@parboxrestore{\centering}%
%\let\@makefnmark\@makefnmark@latex
}%
```

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`.

```
\newenvironment{table}
               {\@float{table}}
               {\end@float}
\newenvironment{table*}
               {\@dblfloat{table}}
               {\end@dblfloat}
```

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

```
\newcounter{table}
\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`.

```
\def\fps@table{tbp}
\def\ftype@table{2}
```

```
\def\ext@table{lot}
\def\fnum@table{\tablename~\thetable}
```

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

```
\expandafter\newbox\csname fbox@\ftype@table\endcsname
\expandafter\setbox\csname fbox@\ftype@table\endcsname\hbox{}%

\def\listoftables{\print@toc{lot}}%
\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}`...?)

```
\def\table@hook{\small}%
\def\squeezetable{\def\table@hook{\scriptsize}}%
\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.

```
\def\set@table@environments{%
 \floats@sw{}{%
  \let@environment{longtable@float}{longtable}%
  \let@environment{longtable}{longtable@write}%
  \let@environment{longtable*@float}{longtable*}%
  \let@environment{longtable*}{longtable*@write}%
  \let@environment{turnpage@float}{turnpage}%
  \let@environment{turnpage}{turnpage@write}%
 }%
 \do@if@floats{table}{.tbx}%
}%
\appdef\document@inithook{%
 \set@table@environments
}%
\appdef\class@enddocumenthook{%
 \printtables\relax
}%
\newenvironment{longtable@write}{%
 \write@@float{longtable}{table}%
}{%
 \endwrite@float
}%
\newenvironment{longtable*@write}{%
 \write@@float{longtable*}{table}%
}{%
```

```
 \endwrite@float
}%
\newenvironment{turnpage@write}{%
 \immediate\write\tablewrite{\string\begin{turnpage}}%
}{%
 \immediate\write\tablewrite{\string\end{turnpage}}%
}%
```

\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.

```
\newcommand\printtables{%
 \begingroup
  \let@environment{longtable}{longtable@float}%
  \let@environment{longtable*}{longtable*@float}%
  \let@environment{turnpage}{turnpage@anchored}%
  \prepdef\longtable{\trigger@float@par}%
  \expandafter\prepdef\csname longtable*\endcsname{\trigger@float@par}%
  \expandafter\prepdef\csname table@floats\endcsname{%
   \onecolumngrid@push
  }%
  \expandafter\appdef\csname endtable@floats\endcsname{%
   \onecolumngrid@pop
  }%
  \@ifstar{\true@sw}{\floatp@sw{\true@sw}{\false@sw}}%
  {%
   \print@float{table}{\oneapage}%
  }{%
   \print@float{table}{}%
  }%
 \endgroup
}%
\newenvironment{turnpage@anchored}{%
 \onecolumngrid@push
 \setbox\z@\vbox to\textwidth\bgroup
  \columnwidth\textheight
}{%
  \vfil
 \egroup
 \rotatebox{90}{\box\z@}%
 \onecolumngrid@pop
}%
```

14.10 Videos

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

```
\newenvironment{video}
 {\@float{video}}
 {\end@float}%
\newenvironment{video*}
 {\@dblfloat{video}}
 {\end@dblfloat}%
```

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

```
\newcounter{video}
\renewcommand \thevideo {\@arabic\c@video}
```

File extension and localizable strings.

```
\def\ext@video{lov}%
\def\fname@video{Video}%
\def\lovname{List of Videos}%
```

Float type and default placement.

```
\def\fps@video{tbp}%
\def\ftype@video{4}%
\def\fnum@video{\fname@video~\thevideo}%
\appdef\document@inithook{%
 \@ifxundefined\c@float@type{}{%
  \global\setcounter{float@type}{8}%
 }%
}%
```

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

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

```
\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.

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

```
\appdef\class@documenthook{%
 \do@if@floats{video}{.vdx}%
}%
```

```
\appdef\class@enddocumenthook{%
 \printvideos\relax
}%
```

`\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.

```
\newcommand\printvideos{%
 \@ifstar{\true@sw}{\floatp@sw{\true@sw}{\false@sw}}%
 {%
  \print@float{video}{\oneapage}%
 }{%
  \print@float{video}{}%
 }%
}%
```

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`
`ruledtabular`

```
\def\endtabular@hook{}%
%\RequirePackage{dcolumn}%
%
\appdef\document@inithook{%
 \@ifpackageloaded{dcolumn}{%
  \expandafter\@ifnotrelax\csname NC@find@d\endcsname{}{%
   \newcolumntype{d}{D{.}{.}{-1}}%
  }%
 }{}%
}%
\def\toprule{\hline\hline}%
\def\colrule{\hline}%
\def\botrule{\hline\hline}%
\newenvironment{ruledtabular}{%
 \def\array@default{v}%
 \appdef\tabular@hook{\def\@halignto{to\hsize}}%
 \let\tableft@skip@default\tableft@skip
 \let\tableft@skip\tableft@skip@float
 \let\tabmid@skip@default\tabmid@skip
 \let\tabmid@skip\tabmid@skip@float
 \let\tabright@skip@default\tabright@skip
 \let\tabright@skip\tabright@skip@float
```

```
  \let\array@row@pre@default\array@row@pre
  \let\array@row@pre\array@row@pre@float
  \let\array@row@pst@default\array@row@pst
  \let\array@row@pst\array@row@pst@float
  \appdef\array@row@rst{%
   \let\array@row@pre\array@row@pre@default
   \let\array@row@pst\array@row@pst@default
   \let\tableft@skip\tableft@skip@default
   \let\tabmid@skip\tabmid@skip@default
   \let\tabright@skip\tabright@skip@default
   \appdef\tabular@hook{\let\@halignto\@empty}%
  }%
 }{%
 }%
```

16 Footnote Text

`\@makefntext` `\@makefnmark`

We customize the presentation of the footnote mark: it will not be italic.

```
 \def\@makefntext#1{%
   \def\baselinestretch{1}%
   \parindent1em%
   \noindent
   \hb@xt@1.8em{%
    \hss\@makefnmark
   }%
   #1%
   \par
 }%
 \def\@makefnmark{%
  \hbox{%
   \@textsuperscript{%
    \normalfont\@thefnmark
   }%
  }%
 }%
```

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
\rev@citealp
\rev@citealpnum

We define variants on natbib's commands \citet, \citealp, and \citealpnum. \rev@citealpnum uses a numerical citation. \rev@citealp and \rev@citealpnum 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@citealpnum provides textual citations where superscript citations are the default. These should be accessible via the \citet command.

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

```
\expandafter\DeclareRobustCommand
\expandafter\rev@citet
\expandafter{%
 \expandafter\begingroup
  \expandafter\rtx@swap@citea
  \expandafter\g@bblefirsttoken
               \csname citet \endcsname
}%
\expandafter\DeclareRobustCommand
\expandafter\rev@citealp
\expandafter{%
 \expandafter\begingroup
  \expandafter\rtx@swap@citea
  \expandafter\g@bblefirsttoken
               \csname citealp \endcsname
}%
\expandafter\DeclareRobustCommand
\expandafter\rev@citealpnum
\expandafter{%
 \expandafter\begingroup
  \expandafter\rtx@swap@citenum
  \expandafter\g@bblefirsttoken
               \csname citealp \endcsname
}%
\def\rtx@swap@citenum{%
  \rtx@swap@citea
  \let\@cite\NAT@citenum
```

```
  \let\NAT@mbox\mbox
  \let\citeyear\NAT@citeyear
  \let\NAT@space\NAT@spacechar
}%
\def\g@bblefirsttoken{%
 \expandafter\true@sw
 \expandafter\@empty
}%
```

`\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.

```
\newcommand\rtx@citesuper[3]{%
 \ifNAT@swa
  \leavevmode
  \unskip
% \hspace{1\p@}%
  \textsuperscript{\normalfont#1}%
  \if*#3*\else\ (#3)\fi
 \else
  #1%
 \fi
 \endgroup
}%
```

`\@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.

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

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

```
\def\rtx@bibsection{%
 \@ifx@empty\refname{%
  \par
 }{%
% \let\@hangfroms@section\@hang@froms
  \expandafter\section\expandafter*\expandafter{\refname}%
  \@nobreaktrue
 }%
}%
```

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

`\rtx@def@citea`

`\rtx@def@citea@close`

`\rtx@def@citea@box`

In these procedures, we use `\count@` to count the number of arguments of the `\cite` command, and we use `\c@NAT@ctr` to keep track of which argument we are processing. The latter counter is created by `natbib` and used there solely in

bibliography processing, where it keeps track of the reference number. We take over its use in these macros, but only locally; therefore these procedures should work properly, even within the bibliography. FIXME: check whether this is true!

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

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

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

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

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

```
\def\rtx@swap@citea{%
 \let\NAT@def@citea\rtx@def@citea
 \let\NAT@def@citea@close\rtx@def@citea@close
 \let\NAT@def@citea@box\rtx@def@citea@box
}%
\def\rtx@def@citea{%
 \def\@citea{\NAT@separator\NAT@space}%
 \advance\c@NAT@ctr\@ne
 \@ifnum{\count@>\tw@}{%
  \@ifnum{\c@NAT@ctr=\count@}{\appdef\@citea{\NAT@conj\NAT@space}}{}%
 }{%
  \def\@citea{\NAT@space\NAT@conj\NAT@space}%
 }%
}%
\def\rtx@def@citea@close{%
 \rtx@def@citea
 \prepdef\@citea{\NAT@@close}%
}%
\def\rtx@def@citea@box{%
 \rtx@def@citea@close
 \expandafter\def\expandafter\@citea\expandafter{\expandafter\NAT@mbox\expandafter{\@citea}}%
}%
\def\NAT@conj{and}%
```

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

```
\def\NAT@BibitemShut#1{%
 \def\@bibstop{#1}%
 \let\bibitem@Stop\bibitemStop
 \let\bibitem@NoStop\bibitemNoStop
 \@ifx{\bibitemShut\relax}{\let\@bibitemShut\@empty}{%
```

```
  \expandafter\def\expandafter\@bibitemShut\expandafter{\bibitemShut}%
 }%
}%
```

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

```
\def\BibitemShut@ltx#1{%
 \unskip
 \def\@bibstop{#1}%
 \let\bibitem@Stop\bibitemStop
 \let\bibitem@NoStop\bibitemNoStop
 \@ifx{\bibitemShut\relax}{\let\@bibitemShut\@empty}{%
  \expandafter\def\expandafter\@bibitemShut\expandafter{\bibitemShut}%
 }%
}%
```

```
%\providecommand{\bibAnnote}[3]{%
%  \BibitemShut{#1}%
%  \def\@tempa{#3}\@ifx{\@tempa\@empty}{}{%
%   \begin{quotation}\noindent
%    \textsc{Key:}\ #2\\\textsc{Annotation:}\ \@tempa
%   \end{quotation}%
%  }%
%  \ignorespaces
%}%
%\def\@bibitemShut{}%
%
```

```
\newenvironment{thebibliography}{}{}%
\let\@listi\@empty
\appdef\rtx@require@packages{%
 \RequirePackage[sort&compress]{natbib}[2009/11/07 8.31a (PWD, AO)]%
 \let@environment{NAT@thebibliography}{thebibliography}%
 \let@environment{thebibliography}{rtx@thebibliography}%
 \let\bibliographystyle@latex\bibliographystyle
 \let\NAT@citesuper\rtx@citesuper
```

`\NAT@bibsetnum` `\NAT@bibsetup` `\bibpreamble` `\newblock` `\bibnumfmt` `\NAT@merge`

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.

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.

We define `\bibnumfmt` to be `\place@bibnumber`, which is a macro managed by REVTEX. If the document defines `\bibnumfmt`, then that definition will be used instead, which is what the `natbib` package gives as its programming interface.

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

```
\let\bibsection\rtx@bibsection
\let\NATx@bibsetnum\NAT@bibsetnum
\def\NAT@bibsetnum#1{%
```

```
 \setlength{\topsep}{\z@}%
 \NATx@bibsetnum{\ref{LastBibItem}}%
}%
\let\NATx@bibsetup\NAT@bibsetup
\def\NAT@bibsetup{%
 \setlength{\labelwidth}{\z@}%
 \setlength{\labelsep}{\z@}%
 \setlength{\itemindent}{\z@}%
 \setlength{\listparindent}{\z@}%
 \setlength{\topsep}{\z@}%
 \setlength{\parsep}{\z@}%
 \NATx@bibsetup
}%
\let\bibpreamble\@empty
\def\newblock{\ }%
\let\NATx@bibnumfmt\bibnumfmt
\def\bibnumfmt{\place@bibnumber}%
\let\NAT@merge\thr@@
\let\NAT@citeyear\citeyear
\let\onlinecite\rev@citealp
\let\textcite\rev@citet
```

The following is needed until `natbib` is at 8.31b.

```
\@ifx{\BibitemShut\NAT@BibitemShut}{%
 \class@info{Repairing natbib's \string\BibitemShut}%
 \let\BibitemShut\BibitemShut@ltx
}{}%
```

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

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

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

```
\let\bibliographystyle@latex\bibliographystyle
\def\bibliographystyle{\@booleantrue\bibliographystyle@sw\def\@bibstyle}%
\@booleanfalse\bibliographystyle@sw
```

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

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

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

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

\def\bibitemNoStop{%
 \@ifx@empty\@bibitemShut{.\spacefactor\@mmm\space}{\@bibitemShut}%
}%

\def\bibitemContinue{%
 \@ifx@empty\@bibitemShut{;\spacefactor\@mmm\space}{\@bibitemShut}%
}%

\def\bibitemContinue@Stop{%
 \@ifx@empty\@bibitemShut{\spacefactor\@mmm\space}{\@bibitemShut}%
}%
```

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

```
%\let\bibitemContinue\bibitemContinue@rtx
%
```

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

```
}%
```

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

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

`\onlinecite` `\textcite`

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

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

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

`\bibliography`

Provide a hook for supplying BibTEX a bibliographic database that may contain, say, footnotes.

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

```
\let\bibliography@latex\bibliography
\def\bibliography#1{%
 \auto@bib@empty
```

```
\begingroup
 \let\auto@bib@innerbib\@empty
 \@ifx@empty{\pre@bibdata}{%
  \bibliography@latex{#1}%
 }{%
  \@if@empty{#1}{%
   \expandafter\bibliography@latex\expandafter{\pre@bibdata}%
  }{%
   \expandafter\bibliography@latex\expandafter{\pre@bibdata,#1}%
  }%
 }%
 \endgroup
}%
\let\pre@bibdata\@empty
```

rtx@thebibliography
\present@bibnote

We put a tail patch into `\thebibliogrphy` and a headpatch into `\endthebibliography`.

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 `\bibitem`s for the bibliography: we produce no bibliography head at all.

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

The following line was commented out:

```
%\@endnotesinbib
%
```

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

```
 \auto@bib@innerbib
 \edef\@currentlabel{\arabic{NAT@ctr}}%
 \label{LastBibItem}%
 \endNAT@thebibliography
 \aftergroup\auto@bib@empty
}%
\def\present@bibnote#1#2{%
 \item[%
  \textsuperscript{%
   \normalfont
   \Hy@raisedlink{\hyper@anchorstart{frontmatter.#1}\hyper@anchorend}%
   \begingroup
```

```
    \csname c@\@mpfn\endcsname#1\relax
    \frontmatter@thefootnote
   \endgroup
  }%
 ]#2\par
```

The following line was commented out:

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

```
}%
```

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

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

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

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

```
\def\write@bibliographystyle{%
 \@ifxundefined\@bibstyle{}{%
  \expandafter\bibliographystyle@latex\expandafter{\@bibstyle}%
  \bibliographystyle@sw{}{\@bibdataout@rev}%
 }%
 \global\let\write@bibliographystyle\relax
}%
\AtEndDocument{\write@bibliographystyle}%
```

`\rtx@@citetp` `\rtx@citex` `\super@cite@let` `\super@cite@end` `\super@cite@swap` We wish to extend `natbib` to move spaces and citations around a superscript-style citation, imitating Donald Arseneau's `cite` package with the `super`.

The `\rtx@@citetp` procedure is substituted for `\NAT@@citetp`; it then calls the `\rtx@citex` procedure and implements the features of the `citeautoscript` 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 `\cite`s to accomodate superscript style.

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

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

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

\endcsname\relax. To add a character to the set, do, say, \expandafter\let\csnamertx@automove;\endcsname\@empty.

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

```
\def\rtx@@citetp[#1]{\@ifnextchar[{\rtx@citex[#1]}{\rtx@citex[][#1]}}%
\def\rtx@citex[#1][#2]#3{%
 \begingroup
  \def\@tempa{[#1][#2]{#3}}%
  \@ifx{\@cite\NAT@citesuper}{%
   \leavevmode
   \skip@\lastskip
   \unskip
   \super@cite@let
  }{%
   \super@cite@end
  }%
}%
\def\super@cite@let{%
 \futurelet\@let@token\super@cite@check
}%
\def\super@cite@end{%
 \aftergroup\@citex\expandafter\endgroup\@tempa
}%
\def\super@cite@check{%
 \@ifx{\@let@token\@sptoken}{%
  \super@cite@end
 }{%
  \super@cite@swap
 }%
}%
\long\def\super@cite@swap#1{%
 \expandafter\@ifx\expandafter{\csname rtx@automove#1\endcsname\@empty}{%
  #1%
  \super@cite@let
 }{%
  \super@cite@end
  #1%
 }%
}%
\expandafter\let\csname rtx@automove.\endcsname\@empty
\expandafter\let\csname rtx@automove,\endcsname\@empty
\expandafter\let\csname rtx@automove:\endcsname\@empty
\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.

```
\appdef\class@documenthook{%
 \citeautoscript@sw{%
  \@ifx{\@cite\NAT@citesuper}{%
   \let\NAT@@citetp\rtx@@citetp
  }{}%
 }{}%
}%
```

Resolve an incompatability between `natbib` and `listings`. The latter package tests `\chapter`(which has now been `\let` to `\relax` as a side effect `natbib`'s use of LaTeX'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 `\endnote`s and `\rtx@bibnotes`

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

```
\def\mini@note{\save@note\mini@notes}%Implicit #2
\def\save@note#1#2{%
  \stepcounter\@mpfn
  \protected@xdef\@thefnmark{\thempfn}%
  \@footnotemark
  \expandafter\g@addto@macro
  \expandafter#1%
  \expandafter{%
  \expandafter \@@footnotetext
  \expandafter {\@thefnmark}{#2}%
               }%
}%
\long\def\@@footnotetext#1{\def\@thefnmark{#1}\@footnotetext}%
\let\mini@notes\@empty
```

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

```
%\def\@endnote{%
% \begingroup
%  \aftergroup\@footnotemark
%  \aftergroup\@endnotetext
%  \@ifnextchar[{%
%   \@xendnote
%  }{%
```

```
%   \stepcounter{footnote}%
%   \protected@xdef\@tempa{\thefootnote}%
%   \expandafter\@xendnote\expandafter[\the\c@footnote]%
% }%
%}%
%
```

`\@xendnote`

```
%\def\unused@xendnote[#1]{%
%  \begingroup
%   \c@footnote#1\relax
%    \end{macrocode}
% New for 4.1
%    \begin{macrocode}
%   \unrestored@protected@xdef\@endnotelabel{Note\thefootnote}%
%   \authoryear@sw{%
%    \unrestored@protected@xdef\@thefnmark{\noexpand\ref{\@endnotelabel}}%
%   }{%
%    \unrestored@protected@xdef\@thefnmark{\@endnotelabel}%
%   }%
%    \end{macrocode}
% Was:
% \unrestored@protected@xdef\@thefnmark{endnote\thefootnote}%
% End 4.1 changes
%    \begin{macrocode}
%  \endgroup
% \endgroup
%}%
%\def\@endnotemark{%
% \expandafter\cite\expandafter{\@thefnmark}%
%}%
%
```

```
\def\rev@citemark#1{%
 \expandafter\cite\expandafter{\@thefnmark}%
}%
\def\rev@endtext#1{%
 \let\@endnotelabel\@thefnmark
 \@endnotetext
}%
```

`\endnote@ext` `\bibdata@app` `\bibdata@ext`

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

```
\def\endnote@ext{.end}%
\def\bibdata@app{Notes}%
\def\bibdata@ext{bib}%
```

`\@endnotetext`

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

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

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

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

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

\@doendnote is obsolete.

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

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

Timing note: doing \openout should be deferred until the beginning of the document, as is done here. This allows one to make a format (revtex4-2.dtx.fmt) file out of this class.

```
\long\def\@endnotetext#1{%
  \begingroup
    \endnote@relax
    \immediate\write\@bibdataout{%
     @FOOTNOTE{%
      \@endnotelabel,%
```

The key field is recommended in cases where there is no author (see revtex4-2.dtxbtxdoc).

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

The note field is simply the content of the footnote.

```
       note="#1"%
     }%
    }%
  \endgroup
}%
\newwrite\@bibdataout
```

\endnote@relax At \AtBeginDocument time, we open the job's revtex4-2.dtx.bib file.

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

```
\def\endnote@relax{%
 \let\label\relax \let\index\relax \let\glossary\relax
 \let\cite \relax \let\ref  \relax \let\pageref \relax
 \let\(    \relax \let\)    \relax \let\\       \relax
 \let~\relax

 %\let\protect\noexpand
 %

 \let \protect \@unexpandable@protect
 \newlinechar`\^^M%

 %\newlinechar`\ %
 %

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

\@bibdataout@init \@bibdataout@aps At \AtBeginDocument time, we open the job's revtex4-2.dtx.bib file. The hook is available for use by a society to place its own @CONTROL record in the \@bibdataout stream.

```
\appdef\class@documenthook{\@bibdataout@init}%
\def\@bibdataout@init{%
 \immediate\openout\@bibdataout\pre@bibdata.\bibdata@ext\relax
}%
\def\@bibdataout@rev{%
 \immediate\write\@bibdataout{%
```

The entry that controls processing of the revtex4-2.dtx.bst file has entry type @CONTROL. The citation key (REVTEX42Control) is effectively a version number, which the revtex4-2.dtx.bst can use to interpret the bib entry.

```
  @CONTROL{%
   REVTEX42Control%
```

Say if we want the eprint field disabled. Otherwise accept the default of the revtex4-2.dtx.bst.

```
    \eprint@enable@sw{}{,eprint="1"}%
  }%
 }%
```

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

```
 \if@filesw
  \immediate\write\@auxout{\string\citation{REVTEX42Control}}%
 \fi
}%
```

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

Moving footnotes to the bibliogrphy is now accomplished through the automatic generation of a job BiBTEX database (called \pre@bibdata) containing the footnotes.

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

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

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

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

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

```
\def\make@footnote@endnote{%
 \footinbib@sw{%
  \authoryear@sw{}{%
   \ltx@footnote@push
   \def\thempfn{Note\thefootnote}%
   \let\ltx@footmark\rev@citemark
   \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
%
  }%
 }{}%
}%
\def\ltx@footnote@push{%
 \let\ltx@footmark@latex\ltx@footmark
 \let\ltx@foottext@latex\ltx@foottext
 \let\thempfn@latex\thempfn
 \def\ltx@footnote@pop{%
  \let\ltx@footmark\ltx@footmark@latex
  \let\ltx@foottext\ltx@foottext@latex
  \let\thempfn\thempfn@latex
 }%
}%
```

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`).

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

`\auto@bib` `\auto@bib@empty` `\test@bbl@sw` `\bibitem@set` `\auto@bib@innerbib` `\thebibliography@nogroup`

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 revtex4-2.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.

```
\def\auto@bib{%
 \@ifx@empty\@FMN@list{%
  \footinbib@sw{%
   \@ifnum{\csname c@\@mpfn\endcsname>\z@}{%
    \true@sw
   }{%
    \test@bbl@sw
   }%
  }{%
   \test@bbl@sw
  }%
 }{%
  \true@sw
 }%
 {%
  \bibliography{}%
 }{}%
}%
\def\auto@bib@empty{%
 \let\auto@bib\@empty
}%
```

Testing the revtex4-2.dtx.bbl file involves defanging all expected commands and processing that file inside a box register (that will be simply discarded). We provide a new meaning for the `\bibitem` command: it queues a Boolean.

```
\def\test@bbl@sw{%
```

```
\setbox\z@\vbox\bgroup
 \let\providecommand\providecommand@j@nk
 \let\bibfield\@gobbletwo
 \let\bibinfo\@gobbletwo
 \let\translation\@gobble
 \let\BibitemOpen\@empty
 \let\bibitemStop\@empty
 \let\bibitemNoStop\@empty
 \let\EOS\@empty
 \let\BibitemShut\@gobble
 \let\bibAnnoteFile\@gobbletwo
 \let\bibAnnote\@gobblethree
 \let\textbf\@gobble
 \let\emph\@gobble
 \@booleanfalse\bibitem@sw
 \let\bibitem\bibitem@set
 \auto@bib@innerbib
 \bibitem@sw{\aftergroup\true@sw}{\aftergroup\false@sw}%
\egroup
}%
```

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

```
\newcommand\bibitem@set[1][]{%
 \bibitem@sw{}{%
  \@booleantrue\bibitem@sw
  \aftergroup\@booleantrue\aftergroup\bibitem@sw
 }%
}%
```

The `\auto@bib@innerbib` procedure reads in the revtex4-2.dtx.bbl file (if it exists) within a context where its `thebibliography` environment does nothing, not even establishing a group.

```
\def\auto@bib@innerbib{%
 \begingroup
  \let@environment{thebibliography}{thebibliography@nogroup}%
  \bibliography{}%
 \endgroup
}%
```

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

```
\def\thebibliography@nogroup#1{%
 \endgroup
 \def\@currenvir{thebibliography}%
}%
\def\endthebibliography@nogroup{\begingroup}%
```

The following should be part of revtex4-2.dtxltxutil.

```
\long\def \@gobblethree #1#2#3{}%
```

```
\def\providecommand@j@nk#1[#2]{%
 \@ifnum{#2=\z@}{\def\j@nk}{%
  \@ifnum{#2=\@ne}{\def\j@nk##1}{%
   \@ifnum{#2=\tw@}{\def\j@nk##1##2}{%
    \@ifnum{#2=\thr@@}{\def\j@nk##1##2##3}{%
    }%
   }%
  }%
 }%
}%
```

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 pramble, and the counter itself will be preset at the beginning of the document.

```
\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`.

```
\appdef\setup@hook{%
 \tabbingsep \labelsep
 \leftmargin\leftmargini
 \labelwidth\leftmargin\advance\labelwidth-\labelsep
 \let\@listi\@listI
 \@listi
}%
%    \begin{macrocode}
%
% We ensure that the ``environment'' component mark (implemented by \file{ltxgrid.dtx})
% is initialized properly (via a hook, itself defined via \file{ltxutil.dtx}).
%    \begin{macrocode}
\appdef\class@documenthook{%
 \global\c@page\@ne
 \def\curr@envir{document}%
 \mark@envir{\curr@envir}%
}%
```

`\open@onecolumn`
`\open@column@two`

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 TEX 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 TEX. This is a bug, but not one "acceptible to D. E. Knuth", so it will never be fixed.

```
\def\open@onecolumn{%
 \open@column@one\@ne
 \set@colht
 \@floatplacement
 \@dblfloatplacement
}%
\def\open@twocolumn{%
 \open@column@mlt\tw@
 \set@colht
 \@floatplacement
 \@dblfloatplacement
 \sloppy
 \let\set@listindent\set@listindent@
}%
```

18 \appendix

```
%\newif\ifappendixon
```

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

```
\def\appendix{%
 \par
%\appendixontrue
 \setcounter{section}\z@
 \setcounter{subsection}\z@
 \setcounter{subsubsection}\z@
 \def\thesubsection{\arabic{subsection}}%
 \def\thesubsubsection{\alph{subsubsection}}%
 \@addtoreset{equation}{section}%
 \def\theequation@prefix{\thesection}%
 \addtocontents{toc}{\protect\appendix}%
 \@ifstar{%
  \def\thesection{\unskip}%
  \def\theequation@prefix{A.}%
 }{%
  \def\thesection{\Alph{section}}%
 }%
}%
```

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` `\close@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.

```
\def\title@column#1{%
 \minipagefootnote@init
 #1%
 \minipagefootnote@foot
}%
\def\close@column{%
 \newpage
}%
```

19.2 Galley Style: Margin Changes

A variant of preprint processing. Emulate journal appearance somewhat.

`widetext@galley` DPC: We're in galley style so do a lob sided display environment.

QUERY: How can we be sure that we are in galley style? ANSWER: as noted elsewhere, require that both `\twocolumn@sw` and `\preprintsty@sw` be false.

```
\def\galley@outdent{\rightmargin-\columnwidth\advance\rightmargin-\columnsep}%
\let\widetext@outdent\@empty
\newenvironment{widetext@galley}{%
  \list{}{%
    \topsep        \z@skip
    \listparindent \parindent
    \itemindent    \parindent
    \leftmargin    \z@
    \parsep        \z@\@plus\p@
    \widetext@outdent
    \relax
  }%
  \item\relax
}{
  \endlist
}%
```

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.

```
\def\title@column@grid#1{%
 \minipagefootnote@init
  \onecolumngrid
  \begingroup
   \let\@footnotetext\frontmatter@footnotetext
%<ignore>  \let\set@footnotewidth\set@footnotewidth@two
   \ltx@no@footnote
   #1%
  \endgroup
  \twocolumngrid
 \minipagefootnote@foot
}%
\def\close@column@grid{%
 \balancelastpage@sw{%
  \onecolumngrid
%<ignore>  \twocolumngrid
 }{}%
}%
```

widetext@grid We slip into the one-column page grid within the scope of this environment.

Note that we set adornments above and below the widettext. These are set as leaders, so they will disappear at a page break.

```
\newenvironment{widetext@grid}{%
  \par\ignorespaces
  \setbox\widetext@top\vbox{%
%<ignore>  \vskip15\p@
   \hb@xt@\hsize{%
    \leaders\hrule\hfil
    \vrule\@height6\p@
   }%
%<ignore>  \vskip6\p@
  }%
  \setbox\widetext@bot\hb@xt@\hsize{%
    \vrule\@depth6\p@
    \leaders\hrule\hfil
  }%
  \onecolumngrid
  \vskip10\p@
  \dimen@\ht\widetext@top\advance\dimen@\dp\widetext@top
  \cleaders\box\widetext@top\vskip\dimen@
%<ignore> \let\set@footnotewidth\set@footnotewidth@two
  \vskip6\p@
  \prep@math@patch
}{%
  \par
  \vskip6\p@
```

```
  \setbox\widetext@bot\vbox{%
   \hb@xt@\hsize{\hfil\box\widetext@bot}%
%<ignore>  \vskip14\p@
  }%
  \dimen@\ht\widetext@bot\advance\dimen@\dp\widetext@bot
  \cleaders\box\widetext@bot\vskip\dimen@
  \vskip8.5\p@
  \twocolumngrid\global\@ignoretrue
  \@endpetrue
}%
\newbox\widetext@top
\newbox\widetext@bot
```

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

```
\def\set@page@grid{%
 \twocolumn@sw{%
```

The following two assignments determine what procedures are to be executed when the footnote set width is calculated, and how footnotes are to be composed at the bottom of the page. A society or journal wishing to do otherwise will override this code.

```
  \let\set@footnotewidth\set@footnotewidth@two
  \let\compose@footnotes\compose@footnotes@two
  \let@environment{widetext}{widetext@grid}%
  \let\title@column\title@column@grid
  \let\close@column\close@column@grid
 }{%
  \let@environment{widetext}{widetext@galley}%
  \preprintsty@sw{%
```

Change the page grid not at all.

```
  }{%
```

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

```
   \galley@sw{%
    \let\widetext@outdent\galley@outdent
   }{}%
  }%
 }%
}%
\appdef\setup@hook{\set@page@grid}%
```

20 Old font commands

```
\DeclareOldFontCommand{\rm}{\normalfont\rmfamily}{\mathrm}
\DeclareOldFontCommand{\sf}{\normalfont\sffamily}{\mathsf}
\DeclareOldFontCommand{\tt}{\normalfont\ttfamily}{\mathtt}
\DeclareOldFontCommand{\bf}{\normalfont\bfseries}{\mathbf}
\DeclareOldFontCommand{\it}{\normalfont\itshape}{\mathit}
\DeclareOldFontCommand{\sl}{\normalfont\slshape}{\@nomath\sl}
```

```
\DeclareOldFontCommand{\sc}{\normalfont\scshape}{\@nomath\sc}
\DeclareRobustCommand*\cal{\@fontswitch\relax\mathcal}
\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.

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

```
\def\partname{Part}
```

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

```
\def\tocname{Contents}
```

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

```
\def\lofname{List of Figures}
```

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

```
\def\lotname{List of Tables}
```

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

```
\def\refname{References}
```

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

```
\def\indexname{Index}
```

`\figurename` Text entity `\figurename` is used in `figure`, `\figuresname` in `\printfigures`.

```
\def\figurename{FIG.}
\def\figuresname{Figures}%
```

\tablename Text entity \tablename is used in table, \tablesname in \printtables.

```
\def\tablename{TABLE}
\def\tablesname{Tables}%
```

\abstractname Text entity \abstractname is used in abstract.

```
\def\abstractname{Abstract}
```

\appendixesname Text entity \appendixesname is used in TOC.
\appendixname

```
\def\appendixesname{Appendixes}%
\def\appendixname{Appendix}%
```

\acknowledgmentsname Text entity \acknowledgmentsname is used in acknowledgments.

```
\def\acknowledgmentsname{Acknowledgments}
```

\journalname This should be set by the society journal options, eg 'pra'.

```
\def\journalname{??}
```

\copyrightname Default layout does not assign copyright, but a journal that wants to might use this.

```
\def\copyrightname{??}
```

\andname The text string "and" for use in author lists.

```
\def\andname{and}
```

\@pacs@name The text string prepended to PACS numbers, resp. to keywords.
\@keys@name

```
\def\@pacs@name{PACS numbers: }%
\def\@keys@name{Keywords: }%
```

\ppname The text string "pp" for use in page ranges.

```
\def\ppname{pp}
```

\numbername The text string "number" for use in article reference.

```
\def\numbername{number}
```

\volumename The text string "volume" for use in article reference.

```
\def\volumename{volume}
```

\Dated@name These texts are used in the \date, et al. commands.
\Received@name
\Revised@name
\Accepted@name
\Published@name

```
\def\Dated@name{Dated: }%
\def\Received@name{Received }%
\def\Revised@name{Revised }%
\def\Accepted@name{Accepted }%
\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.

```
\def\address{\replace@command\address\affiliation}%
\def\altaddress{\replace@command\altaddress\altaffiliation}%
\newenvironment{references}{%
 \class@warn@end{The references environment is not supported; use thebibliography instead.}
 \gdef\references{\thebibliography{}}\references
}{%
 \endthebibliography
}%
\def\draft{%
 \class@warn@end{Command \string\draft\space is obsolete;^^JInvoke option draft instead.}%
 \@booleantrue\draft@sw
}%
\def\tighten{%
 \class@warn@end{Command \string\tighten\space is obsolete;^^JInvoke option tightenlines instea
 \@booleantrue\tightenlines@sw
}%
\def\tableline{%
 \noalign{%
  \class@warn@end{Command \string\tableline\space is obsolete;^^JUse \string\colrule\space inst
  \global\let\tableline\colrule
 }%
 \tableline
}%
\def\case{\replace@command\case\frac}%
\def\slantfrac{\replace@command\slantfrac\frac}%
\def\tablenote{\replace@command\tablenote\footnote}%
\def\tablenotemark{\replace@command\tablenotemark\footnotemark}%
\def\tablenotetext{\replace@command\tablenotetext\footnotetext}%
% Lose the following definition:
\DeclareRobustCommand\REV@text[1]{%
 \relax
 \ifmmode
  \mathchoice
   {\hbox{{\everymath{\displaystyle     }#1}}}%
   {\hbox{{\everymath{\textstyle        }#1}}}%
   {\hbox{{\everymath{\scriptstyle      }\let\f@size\sf@size\selectfont#1}}}%
   {\hbox{{\everymath{\scriptscriptstyle}\let\f@size\ssf@size\selectfont#1}}}%
  \glb@settings
 \else
  \mbox{#1}%
 \fi
}%
```

```
% Lose the following definition:
\DeclareRobustCommand\REV@bbox[1]{%
 \relax
 \ifmmode
  \mathchoice
   {\hbox{{\everymath{\displaystyle     }\boldmath$#1$}}}%
   {\hbox{{\everymath{\textstyle        }\boldmath$#1$}}}%
   {\hbox{{\everymath{\scriptstyle      }\boldmath$#1$}}}%
   {\hbox{{\everymath{\scriptscriptstyle}\boldmath$#1$}}}%
  \glb@settings
 \else
  \mbox{#1}%
 \fi
}%
\DeclareRobustCommand\REV@bm[1]{%
 \class@warn@end{To use \string\bm, please load the bm package!}%
 \global\let\bm\relax
}%
\def\FL{\obsolete@command\FL}%
\def\FR{\obsolete@command\FR}%
\def\narrowtext{\obsolete@command\narrowtext}%
\def\mediumtext{\obsolete@command\mediumtext}%
\newenvironment{quasitable}{%
 \let@environment{tabular}{longtable}%
}{%
}%
```

`\text` `\bm` `\bibinfo` `\eprint` `\url` If not otherwise defined, give default meanings to certain commands. FIXME: `\bibinfo`?

```
\let\text\REV@text
\let\bm\REV@bm
\appdef\setup@hook{%
 \providecommand\bibinfo[2]{#2}%
 \providecommand\eprint[2][]{#2}%
%\providecommand\url[1]{#1}%
}%
```

`\bbox`

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

`\mathletters`

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

\eqnum

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

We read in the symbol definitions.

```
\appdef\rtx@require@packages{%
 \RequirePackage{revsymb4-2}%
}%
\appdef\class@documenthook{\revsymb@inithook}%
```

23 Corrected Indentation for `tableofcontents`

Corrected indentation for `tableofcontents`, when appearing with `listoffigure` or `listoftable`.

```
%%
\def\@startflt#1{%
  \begingroup
    %\toc@pre
    \makeatletter
    \@input{\jobname.#1}%
    \if@filesw
      \expandafter\newwrite\csname tf@#1\endcsname
      \immediate\openout \csname tf@#1\endcsname \jobname.#1\relax
    \fi
    \@nobreakfalse
    %\toc@post
  \endgroup
}%
\def\att@TOC{toc}%
\def\print@toc#1{%
 \begingroup
  \expandafter\section
  \expandafter*%
  \expandafter{%
              \csname#1name\endcsname
              }%
  \let\appendix\appendix@toc
  \def\tempa{#1}%
  \ifx\tempa\att@TOC%%
  \@starttoc{#1}%
  \else%%
  \@startflt{#1}%%
  \fi%%
 \endgroup
}%
%%
```

24 Patches for lineno.sty

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

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

```
\def\@LN@LLerror@org{%
 \PackageError{lineno}{%
  \string\linelabel\space without \string\linenumbers
 }{%
  Just see documentation. (New feature v4.11)%
 }%
 \@gobble
}%
\def\@LN@LLerror@ltx{%
 \PackageWarning{lineno}{%
  To make the \string\linelabel\space command work, you must issue the \string\linenumbers\ com
 }%
 \@gobble
}%
```

If appropriate, enable line numbering within the abstract.

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

```
\appdef\class@documenthook{%
 \@ifx{\@LN@LLerror\@LN@LLerror@org}{%
  \class@info{Overriding \string\@LN@LLerror}%
  \let\@LN@LLerror\@LN@LLerror@ltx
 }{}%
 \@ifpackageloaded{lineno}{%
  \@ifxundefined{\set@linepenalties}{}{%
   \def\prep@absbox{\set@linepenalties}%
   \def\post@absbox{\let\@LN@parpgbrk\@empty\@linenumberpar}%
  }%
 }{}%
}%
```

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.

25 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.

25.1 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 REVTEX document class or the selected journal substyle. That is, you have the power to really mess things up badly.

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

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

```
\appdef\rtx@require@packages{%
 \InputIfFileExists{\jobname.rty}{}{}%
}%
```

25.2 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.

```
\@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`.

```
\@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`.

```
\@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`.

```
\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`.

```
\@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 overriden the assignment of the society.

```
\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.

```
\@options
```

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

```
\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.

```
\appdef\setup@hook{\normalsize}%
\setup@hook
```

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

```
%<*ignore>
 \def\rtx@fin@year{2010}%
```

```
\def\rtx@fin@month{01}%
\def\rtx@fin@day{01}%
\def\rtx@fin@warn{%
 \@ifnum{\rtx@fin@year>\the\year\relax}{\true@sw}{%
  \@ifnum{\rtx@fin@month>\the\month\relax}{\true@sw}{%
   \@ifnum{\rtx@fin@day>\the\day\relax}{\true@sw}{%
    \false@sw
   }%
  }%
 }%
 {%
  \class@info{Beta software expires \rtx@fin@year-\rtx@fin@month-\rtx@fin@day; updates availab
 }{%
  \class@warn{Outdated software expired \rtx@fin@year-\rtx@fin@month-\rtx@fin@day; please retr
 }%
}%
%</ignore>
```

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

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

End of the class file.

```
%</package>
```

26 Symbols: the revsymb module

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

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

`\lambdabar`

```
\DeclareRobustCommand\lambdabar{%
  \bgroup
    \def\@tempa{%
      \hbox{%
        \raise.73\ht\z@
        \hb@xt@\z@{%
          \kern.25\wd\z@
          \vrule \@width.5\wd\z@\@height.1\p@\@depth.1\p@
          \hss
        }%
        \box\z@
      }%
    }%
    \mathchoice
      {\setbox\z@\hbox{$\displaystyle     \lambda$}\@tempa}%
      {\setbox\z@\hbox{$\textstyle        \lambda$}\@tempa}%
```

```
      {\setbox\z@\hbox{$\scriptstyle      \lambda$}\@tempa}%
      {\setbox\z@\hbox{$\scriptscriptstyle\lambda$}\@tempa}%
  \egroup
}%
```

\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.

```
\DeclareRobustCommand\openone{\leavevmode\hbox{\small1\normalsize\kern-.33em1}}%
```

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

```
\DeclareRobustCommand\corresponds{\replace@command\corresponds\triangleq}%
\DeclareRobustCommand\overcirc{\replace@command\overcirc\mathring}%
\DeclareRobustCommand\overdots{\replace@command\overdots\dddot}%
\DeclareRobustCommand\REV@triangleq{%
 {\lower.2ex\hbox{=}}{\kern-.75em^\triangle}%
}%
\DeclareRobustCommand\REV@dddot[1]{%
 \@ontopof{#1}{\cdots}{1.0}\mathord{\box2}%
}%
```

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

```
\DeclareRobustCommand\altsuccsim{\succ\kern-.9em_\sim\kern.3em}%
\DeclareRobustCommand\altprecsim{\prec\kern-1em_\sim\kern.3em}%
\let\REV@succsim\altsuccsim
\let\REV@precsim\altprecsim
\DeclareRobustCommand\REV@lesssim{\mathrel{\mathpalette\vereq{<}}}%
\DeclareRobustCommand\REV@gtrsim{\mathrel{\mathpalette\vereq{>}}}%
\DeclareRobustCommand\alt{\lesssim}
\DeclareRobustCommand\agt{\gtrsim}
\def\vereq#1#2{%
 \lower3\p@\vbox{%
  \baselineskip1.5\p@
  \lineskip1.5\p@
  \ialign{$\m@th#1\hfill##\hfil$\crcr#2\crcr\sim\crcr}%
 }%
}%
```

\tensor \overstar \loarrow \roarrow

```
\DeclareRobustCommand\tensor[1]{\@ontopof{#1}{\leftrightarrow}{1.15}\mathord{\box2}}
\DeclareRobustCommand\overstar[1]{\@ontopof{#1}{\ast}{1.15}\mathord{\box2}}
\DeclareRobustCommand\loarrow[1]{\@ontopof{#1}{\leftarrow}{1.15}\mathord{\box2}}
\DeclareRobustCommand\roarrow[1]{\@ontopof{#1}{\rightarrow}{1.15}\mathord{\box2}}
```

\@ontopof

```
\def\@ontopof#1#2#3{%
 {%
  \mathchoice
    {\@@ontopof{#1}{#2}{#3}\displaystyle     \scriptstyle      }%
    {\@@ontopof{#1}{#2}{#3}\textstyle        \scriptstyle      }%
    {\@@ontopof{#1}{#2}{#3}\scriptstyle      \scriptscriptstyle}%
    {\@@ontopof{#1}{#2}{#3}\scriptscriptstyle\scriptscriptstyle}%
 }%
}%
```

\@@ontopof Same as REVTEX3, more or less.

```
\def\@@ontopof#1#2#3#4#5{%
  \setbox\z@\hbox{$#4#1$}%
  \setbox\f@ur\hbox{$#5#2$}%
  \setbox\tw@\null\ht\tw@\ht\z@ \dp\tw@\dp\z@
  \@ifdim{\wd\z@>\wd\f@ur}{%
    \setbox\f@ur\hb@xt@\wd\z@{\hss\box\f@ur\hss}%
    \mathord{\rlap{\raise#3\ht\z@\box\f@ur}\box\z@}%
  }{%
    \setbox\f@ur\hb@xt@.9\wd\f@ur{\hss\box\f@ur\hss}%
    \setbox\z@\hb@xt@\wd\f@ur{\hss$#4\relax#1$\hss}%
    \mathord{\rlap{\copy\z@}\raise#3\ht\z@\box\f@ur}%
  }%
}%
```

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

```
\DeclareRobustCommand\frak{%
 \REVSYMB@warn{%
  Command \string\frak\space unsupported:^^J%
  please use \string\mathfrak\space instead.%
 }%
 \global\let\frak\mathfrak
 \frak
}%
\DeclareRobustCommand\REV@mathfrak{%
 \REVSYMB@warn{%
  Command \string\mathfrak\space undefined:^^J%
  please specify the amsfonts or amssymb option!%
 }%
 \global\let\mathfrak\@firstofone
 \mathfrak
}%
```

\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.

```
\DeclareRobustCommand\Bbb{%
 \REVSYMB@warn{%
```

```
  Command \string\Bbb\space unsupported:^^J%
  please use \string\mathbb\space instead.%
 }%
 \global\let\Bbb\mathbb
 \Bbb
}%
\DeclareRobustCommand\REV@mathfrak{%
 \REVSYMB@warn{%
  Command \string\mathbb\space undefined:^^J%
  please specify the amsfonts or amssymb option!%
 }%
 \global\let\mathbb\@firstofone
 \mathbb
}%
```

`\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!

```
\def\Bigglb{\REV@boldopen \Bigg}%
\def\Biglb {\REV@boldopen \Big }%
\def\bigglb{\REV@boldopen \bigg}%
\def\biglb {\REV@boldopen \big }%
\def\Biggrb{\REV@boldclose\Bigg}%
\def\Bigrb {\REV@boldclose\Big }%
\def\biggrb{\REV@boldclose\bigg}%
\def\bigrb {\REV@boldclose\big }%
\def\REV@pmb#1{%
 \hbox{%
  \setbox\z@=\hbox{#1}%
  \kern-.02em\copy\z@\kern-\wd\z@
  \kern .04em\copy\z@\kern-\wd\z@
  \kern-.02em
  \raise.04em\copy\z@
 }%
}%
\def\REV@boldopen #1#2{\mathopen {\REV@pmb{$#1#2$}}}%
\def\REV@boldclose#1#2{\mathclose{\REV@pmb{$#1#2$}}}%
```

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

```
\def\revsymb@inithook{%
 \@ifxundefined\dddot{\let\dddot\REV@dddot}{}%
 \@ifxundefined\triangleq{\let\triangleq\REV@triangleq}{}%
 \@ifxundefined\succsim{\let\succsim\altsuccsim}{}%
 \@ifxundefined\precsim{\let\precsim\altprecsim}{}%
 \@ifxundefined\lesssim{\let\lesssim\REV@lesssim}{}%
 \@ifxundefined\gtrsim {\let\gtrsim \REV@gtrsim }{}%
 \@ifxundefined\mathfrak{\let\mathfrak\REV@mathfrak}{}%
 \@ifxundefined\mathbb{\let\mathbb\REV@mathbb}{}%
}%
```

```
%</revsymb>
```

27 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.

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

27.1 Defend Against Forseeable Errors

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

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

\def\normalsize{%
   \@setfontsize\normalsize\@xpt{11.5}%
   \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
   \belowdisplayskip \abovedisplayskip
   \abovedisplayshortskip  \abovedisplayskip
   \belowdisplayshortskip \abovedisplayskip
   \let\@listi\@listI
}%

\def\small{%
  \@setfontsize\small\@ixpt{10.5}%
  \abovedisplayskip 8.5\p@ \@plus3\p@ \@minus4\p@
  \belowdisplayskip \abovedisplayskip
  \abovedisplayshortskip \z@ \@plus2\p@
  \belowdisplayshortskip 4\p@ \@plus2\p@ \@minus2\p@
  \def\@listi{%
    \leftmargin\leftmargini
    \topsep 4\p@ \@plus2\p@ \@minus2\p@
    \parsep 2\p@ \@plus\p@ \@minus\p@
    \itemsep \parsep
  }%
}%

\def\footnotesize{%
  \@setfontsize\footnotesize\@viiipt{9.5pt}%
  \abovedisplayskip 6\p@ \@plus2\p@ \@minus4\p@
  \belowdisplayskip \abovedisplayskip
  \abovedisplayshortskip \z@ \@plus\p@
```

```
  \belowdisplayshortskip 3\p@ \@plus\p@ \@minus2\p@
  \def\@listi{%
    \leftmargin\leftmargini
    \topsep 3\p@ \@plus\p@ \@minus\p@
    \parsep 2\p@ \@plus\p@ \@minus\p@
    \itemsep \parsep
  }%
}%
\def\scriptsize{%
 \@setfontsize\scriptsize\@viipt\@viiipt
}%
\def\tiny{%
 \@setfontsize\tiny\@vpt\@vipt
}%
\def\large{%
 \@setfontsize\large\@xiipt{14pt}%
}%
\def\Large{%
 \@setfontsize\Large\@xivpt{18pt}%
}%
\def\LARGE{%
 \@setfontsize\LARGE\@xviipt{22pt}%
}%
\def\huge{%
 \@setfontsize\huge\@xxpt{25pt}%
}%
\def\Huge{%
 \@setfontsize\Huge\@xxvpt{30pt}%
}%
```

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`.

```
\appdef\setup@hook{%
 \twoside@sw{%
%   \oddsidemargin  -.1in
%   \evensidemargin -.4in
    \oddsidemargin  -20pt
    \evensidemargin -20pt
    \marginparwidth 107pt
 }{%
    \oddsidemargin  -.25in
    \evensidemargin -.25in
    \marginparwidth 30pt
 }%
}%
\marginparsep 6pt
\topmargin -61pt
```

```
\headheight 25pt
\headsep 16pt

\topskip 10pt
\splittopskip\topskip

\footskip 30pt

 \textheight = 56pc

\textwidth42.5pc

\columnsep 1.5pc
\columnseprule 0pt

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

\floatsep 12pt plus 2pt minus 2pt
\textfloatsep 20pt plus 2pt minus 4pt
\intextsep 12pt plus 2pt minus 2pt

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

\@fptop 0pt plus 1fil
\@fpsep 8pt plus 2fil
\@fpbot 0pt plus 1fil
\@dblfptop 0pt plus 1fil
\@dblfpsep 8pt plus 2fil
\@dblfpbot 0pt plus 1fil

\marginparpush 5pt

\parskip 0pt plus 1pt
\parindent 10pt
\emergencystretch8\p@

\partopsep 2pt plus 1pt minus 1pt

\leftmargini 25pt
\leftmarginii 22pt
\leftmarginiii 18.7pt
\leftmarginiv 17pt
\leftmarginv 10pt
\leftmarginvi 10pt

\def\@listI{%
  \leftmargin\leftmargini
  \parsep 4\p@ plus2\p@ minus\p@
  \topsep 8\p@ plus2\p@ minus4\p@
  \itemsep 4\p@ plus2\p@ minus\p@
}%
```

```
\labelsep 4pt
\def\@listii{%
  \leftmargin\leftmarginii
  \labelwidth\leftmarginii
  \advance\labelwidth-\labelsep
  \topsep 4\p@ plus2\p@ minus\p@
  \parsep 2\p@ plus\p@ minus\p@
  \itemsep \parsep
}%
\def\@listiii{%
  \leftmargin\leftmarginiii
  \labelwidth\leftmarginiii
  \advance\labelwidth-\labelsep
  \topsep 2\p@ plus\p@ minus\p@
  \parsep \z@
  \partopsep \p@ plus\z@ minus\p@
  \itemsep \topsep
}%
\def\@listiv{%
  \leftmargin\leftmarginiv
  \labelwidth\leftmarginiv
  \advance\labelwidth-\labelsep
}%
\def\@listv{%
  \leftmargin\leftmarginv
  \labelwidth\leftmarginv
  \advance\labelwidth-\labelsep
}%
\def\@listvi{%
  \leftmargin\leftmarginvi
  \labelwidth\leftmarginvi
  \advance\labelwidth-\labelsep
}%
%</10pt>
```

28 The `11pt` class option: the `11pt` module

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

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

28.1 Defend Against Forseeable Errors

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

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

```
 \def\@tempa{%
  \endinput
  \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
 }%
 \expandafter\else
  \def\@tempa{}%
 \expandafter\fi\@tempa
 \class@info{RevTeX pointsize 11pt selected}%

\def\normalsize{%
    \@setfontsize\normalsize\@xipt{13.6}%
    \abovedisplayskip 11\p@ \@plus3\p@ \@minus6\p@
    \belowdisplayskip \abovedisplayskip
    \abovedisplayshortskip  \abovedisplayskip
    \belowdisplayshortskip \abovedisplayskip
    \let\@listi\@listI
}%

\def\small{%
   \@setfontsize\small\@xpt\@xiipt
   \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
   \abovedisplayshortskip \z@ \@plus3\p@
   \belowdisplayshortskip 6\p@ \@plus3\p@ \@minus3\p@
   \def\@listi{\leftmargin\leftmargini
               \topsep 6\p@ \@plus2\p@ \@minus2\p@
               \parsep 3\p@ \@plus2\p@ \@minus\p@
               \itemsep \parsep
   }%
   \belowdisplayskip \abovedisplayskip
}%

\def\footnotesize{%
   \@setfontsize\footnotesize\@ixpt{11}%
   \abovedisplayskip 8\p@ \@plus2\p@ \@minus4\p@
   \abovedisplayshortskip \z@ \@plus\p@
   \belowdisplayshortskip 4\p@ \@plus2\p@ \@minus2\p@
   \def\@listi{\leftmargin\leftmargini
               \topsep 4\p@ \@plus2\p@ \@minus2\p@
               \parsep 2\p@ \@plus\p@ \@minus\p@
               \itemsep \parsep
   }%
   \belowdisplayskip \abovedisplayskip
}%

\def\scriptsize{%
  \@setfontsize\scriptsize\@viiipt{9.5}%
}%
\def\tiny{%
  \@setfontsize\tiny\@vipt\@viipt
}%
\def\large{%
  \@setfontsize\large\@xiipt{14}%
```

```
}%
\def\Large{%
  \@setfontsize\Large\@xivpt{18}%
}%
\def\LARGE{%
  \@setfontsize\LARGE\@xviipt{22}%
}%
\def\huge{%
    \@setfontsize\huge\@xxpt{25pt}%
}%
\def\Huge{%
  \@setfontsize\Huge\@xxvpt{30pt}%
}%
%</11pt>
```

29 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.

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

29.1 Defend Against Forseeable Errors

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

```
\ifx\undefined\substyle@ext
 \def\@tempa{%
  \endinput
  \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
 }%
 \expandafter\else
  \def\@tempa{}%
 \expandafter\fi\@tempa
 \class@info{RevTeX pointsize 12pt selected}%
\def\normalsize{%
  \@setfontsize\normalsize\@xiipt{14pt}%
  \abovedisplayskip 12\p@ \@plus3\p@ \@minus7\p@
  \belowdisplayskip \abovedisplayskip
  \abovedisplayshortskip  \z@ plus3\p@
  \belowdisplayshortskip  6.5\p@ \@plus3.5\p@ \@minus3\p@
  \let\@listi\@listI
}%
 \def\small{%
  \@setfontsize\small\@xipt{14.5pt}%
  \abovedisplayskip 8\p@ \@plus3\p@ \@minus6\p@
  \belowdisplayskip \abovedisplayskip
  \abovedisplayshortskip \z@ \@plus3\p@
```

```
  \belowdisplayshortskip 6.5\p@ \@plus3.5\p@ \@minus3\p@
  \def\@listi{%
    \leftmargin\leftmargini
    \topsep 9\p@ \@plus3\p@ \@minus5\p@
    \parsep 4.5\p@ \@plus2\p@ \@minus\p@
    \itemsep \parsep
  }%
}%
```

Same baselineskip as `\small` ?

```
 \def\footnotesize{%
  \@setfontsize\footnotesize\@xpt{14.5pt}%
  \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
  \belowdisplayskip \abovedisplayskip
  \abovedisplayshortskip \z@ \@plus3\p@
  \belowdisplayshortskip 6\p@ \@plus3\p@ \@minus3\p@
  \def\@listi{%
    \leftmargin\leftmargini
    \topsep 6\p@ \@plus2\p@ \@minus2\p@
    \parsep 3\p@ \@plus2\p@ \@minus\p@
    \itemsep \parsep
  }%
}%
\def\scriptsize{%
  \@setfontsize\scriptsize\@viiipt{9.5pt}%
}%
\def\tiny{%
  \@setfontsize\tiny\@vipt{7pt}%
}%
\def\large{%
  \@setfontsize\large\@xivpt{18pt}%
}%
\def\Large{%
  \@setfontsize\Large\@xviipt{22pt}%
}%
\def\LARGE{%
  \@setfontsize\LARGE\@xxpt{25pt}%
}%
\def\huge{%
    \@setfontsize\huge\@xxvpt{30pt}%
}%
\let\Huge=\huge
%</12pt>
```

30 Page parameters

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

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

```
\appdef\setup@hook{%
 \twoside@sw{%
  \oddsidemargin   0pt
  \evensidemargin  0pt
  \marginparwidth 60pt
 }{%
  \oddsidemargin 0pt
  \evensidemargin 0pt
  \marginparwidth 44pt
 }%
}%
\marginparsep 10pt
\topmargin -37pt
\headheight 12pt
\headsep 25pt

\topskip 10pt
\splittopskip\topskip
\footskip 30pt
\textheight=665.5\p@
\appdef\setup@hook{%
 \tightenlines@sw{%
  \def\baselinestretch{1}%
 }{%
  \def\baselinestretch{1.5}%
 }%
}%
\textwidth 468pt
\columnsep 10pt
\columnseprule 0pt

\footnotesep 1pt
\skip\footins 25.25pt plus 4pt minus 12pt
\def\footnoterule{%
 \dimen@\skip\footins\divide\dimen@\f@ur
 \kern-\dimen@\hrule width.5in\kern\dimen@
}%
\floatsep        14pt plus 2pt minus 4pt
\textfloatsep    20pt plus 2pt minus 4pt
\intextsep       14pt plus 4pt minus 4pt
\dblfloatsep     14pt plus 2pt minus 4pt
\dbltextfloatsep 20pt plus 2pt minus 4pt
\@fptop 0pt plus 1fil
\@fpsep 10pt plus 2fil
\@fpbot 0pt plus 1fil
```

```
\@dblfptop 0pt plus 1fil
\@dblfpsep 10pt plus 2fil%
\@dblfpbot 0pt plus 1fil
\marginparpush 7pt
\parskip 0pt plus 1pt
\parindent 15pt
\emergencystretch8\p@
\partopsep 3pt plus 2pt minus 2pt
\leftmargini   30pt
\leftmarginii  26pt
\leftmarginiii 22pt
\leftmarginiv  20pt
\leftmarginv   12pt
\leftmarginvi  12pt
\def\@listI{\leftmargin\leftmargini \parsep 5\p@ plus2.5\p@ minus\p@
  \topsep 10\p@ plus4\p@ minus6\p@
  \itemsep 5\p@ plus2.5\p@ minus\p@
}%
\labelsep 6pt
\def\@listii{\leftmargin\leftmarginii
  \labelwidth\leftmarginii\advance\labelwidth-\labelsep
  \topsep 5\p@ plus2.5\p@ minus\p@
  \parsep 2.5\p@ plus\p@ minus\p@
  \itemsep \parsep
}%
\def\@listiii{\leftmargin\leftmarginiii
  \labelwidth\leftmarginiii\advance\labelwidth-\labelsep
  \topsep 2.5\p@ plus\p@ minus\p@
  \parsep \z@ \partopsep \p@ plus\z@ minus\p@
  \itemsep \topsep
}%
\def\@listiv{\leftmargin\leftmarginiv
  \labelwidth\leftmarginiv\advance\labelwidth-\labelsep
}%
\def\@listv{\leftmargin\leftmarginv
  \labelwidth\leftmarginv\advance\labelwidth-\labelsep
}%
\def\@listvi{\leftmargin\leftmarginvi
  \labelwidth\leftmarginvi\advance\labelwidth-\labelsep
}%
%</11pt|12pt>
```

31 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 initializations, then code for particular APS journals. In the latter case, the choice is keyed off the macro `\@journal`.

```
%<*aps>
```

31.1 Defend Against Forseeable Errors

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

```
\ifx\undefined\substyle@ext
 \def\@tempa{%
  \endinput
  \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
 }%
 \expandafter\else
  \def\@tempa{}%
 \expandafter\fi\@tempa
 \class@info{RevTeX society APS selected}%
```

Here are the class options relating to the APS:

```
\DeclareOption{pra}{\change@journal{pra}}%
\DeclareOption{prb}{\change@journal{prb}}%
\DeclareOption{prc}{\change@journal{prc}}%
\DeclareOption{prd}{\change@journal{prd}}%
\DeclareOption{pre}{\change@journal{pre}}%
\DeclareOption{prl}{\change@journal{prl}}%
%\changes{4.2b}{2017/11/21}{(MD) Update options for new titles without "Special Topics" and mak
\DeclareOption{prab}{\change@journal{prab}}%
```

```
\DeclareOption{prper}{\change@journal{prper}}%
\DeclareOption{rmp}{\change@journal{rmp}}%
%\changes{4.2b}{2017/11/21}{(MD) Add options for new APS journals and a generic physrev option
\DeclareOption{prx}{\change@journal{prx}}%
\DeclareOption{prapplied}{\change@journal{prapplied}}%
\DeclareOption{prmaterials}{\change@journal{prmaterials}}%
\DeclareOption{prfluids}{\change@journal{prfluids}}%
\DeclareOption{physrev}{\change@journal{physrev}}%
```

31.2 Abbreviations

The following macros constitute typing shortcuts for certain journal names.

```
\def\adv{AIP Advances}%
\def\ao{Appl.\ Opt.}%
\def\ap{Appl.\ Phys.}%
\def\apl{Appl.\ Phys.\ Lett.}%
\def\apm{Appl.\ Phys.\ Lett.\ Mater.}%
\def\apj{Astrophys.\ J.}%
\def\bell{Bell Syst.\ Tech.\ J.}%
\def\bmf{Biomicrofluidics}%
\def\cha{Chaos}%
\def\jqe{IEEE J.\ Quantum Electron.}%
\def\assp{IEEE Trans.\ Acoust.\ Speech Signal Process.}%
\def\aprop{IEEE Trans.\ Antennas Propag.}%
\def\mtt{IEEE Trans.\ Microwave Theory Tech.}%
\def\iovs{Invest.\ Ophthalmol.\ Vis.\ Sci.}%
\def\jcp{J.\ Chem.\ Phys.}%
\def\jap{J.\ Appl.\ Phys.}%
\def\jmp{J.\ Math.\ Phys.}%
\def\jmo{J.\ Mod.\ Opt.}%
\def\josa{J.\ Opt.\ Soc.\ Am.}%
\def\josaa{J.\ Opt.\ Soc.\ Am.\ A}%
\def\josab{J.\ Opt.\ Soc.\ Am.\ B}%
\def\jpp{J.\ Phys.\ (Paris)}%
\def\jpr{J.\ Phys.\ Chem.\ Ref.\ Data}%
\def\ltp{Low.\ Temp.\ Phys.}%
\def\nat{Nature (London)}%
\def\oc{Opt.\ Commun.}%
\def\ol{Opt.\ Lett.}%
\def\pl{Phys.\ Lett.}%
\def\pop{Phys.\ Plasmas}%
\def\pof{Phys.\ Fluids}%
\def\pra{Phys.\ Rev.\ A}%
\def\prb{Phys.\ Rev.\ B}%
\def\prc{Phys.\ Rev.\ C}%
\def\prd{Phys.\ Rev.\ D}%
\def\pre{Phys.\ Rev.\ E}%
\def\prl{Phys.\ Rev.\ Lett.}%
\def\rmp{Rev.\ Mod.\ Phys.}%
```

```
\def\rsi{Rev.\ Sci.\ Instrum.}%
\def\rse{J.\ Renewable Sustainable Energy}%
\def\pspie{Proc.\ Soc.\ Photo-Opt.\ Instrum.\ Eng.}%
\def\sjqe{Sov.\ J.\ Quantum Electron.}%
\def\vr{Vision Res.}%
\def\sd{Structural\ Dynamics}%
\def\jor{J.\ Rheol.}%
\def\cp{AIP\ Conference\ Proceedings}%
```

31.3 APS Setup

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

31.3.1 Title block

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

`\@fnsymbol` The LaTeX kernel definition of `\@fnsymbol` is overridden. The definition in revtex4-2.dtxfixltx2e.sty serves as a guide to the new way to symbol, working in both text- and math modes.

revtex4-2.dtxfixltx2e.sty duplicates some features of revtex4-2.dtxltxgrid and revtex4-2.dtxltxutil, however, so it may be incompatible with REVTeX. In case it is not loaded, we must provide a meaning for `\TextOrMath`, which that package makes robust. I believe that it is `\@fnsymbol` itself that ought to be robustified. eTeX further complicates matters; we do not especially accomodate it.

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

```
\def\@fnsymbol#1{%
 \ensuremath{%
  \ifcase#1\or
   *\or
   \dagger\or
   \ddagger\or
   \mathsection\or
   \mathparagraph\or
%  \|\or
   **\or
   \dagger\dagger\or
   \ddagger\ddagger\else
   \mathsection\mathsection\or
   \mathparagraph\mathparagraph\or
   ***\or
   \dagger\dagger\dagger\or
   \ddagger\ddagger\ddagger\else
   \mathsection\mathsection\mathsection\or
   \mathparagraph\mathparagraph\mathparagraph\or
```

```
%
   \@ctrerr
  \fi
 }%
}%
\appdef\document@inithook{%
 \@ifxundefined\TextOrMath{%
  \DeclareRobustCommand\TextOrMath{\@ifmmode{\false@sw}{\true@sw}}%
 }{}%
}%
\let\thefootnote@latex\thefootnote
```

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

```
\clo@groupedaddress
```

`\titlepage`

```
\renewenvironment{titlepage}{%
  \let\wastwocol@sw\twocolumn@sw
  \onecolumngrid
  \newpage
  \thispagestyle{titlepage}%
  \c@page\z@
```

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

```
}{%
  \wastwocol@sw{\twocolumngrid}{\newpage}%
}%
```

`\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.

```
\def\frontmatter@abstractheading{%
 \preprintsty@sw{%
  \begingroup
   \centering\large
   \abstractname
   \par
  \endgroup
 }{}%
}%
```

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

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

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

```
\def\frontmatter@abstractfont{%
 \small
 \parindent1em\relax
```

```
 \adjust@abstractwidth
}%
\def\adjust@abstractwidth{%
 \dimen@\textwidth\advance\dimen@-\frontmatter@abstractwidth
 \divide\dimen@\tw@
 \galley@sw{%
  \advance\rightskip\tw@\dimen@
 }{%
  \advance\leftskip\dimen@
  \advance\rightskip\dimen@
 }%
 \@totalleftmargin\leftskip
}%
```

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`.

```
\@booleanfalse\preprintsty@sw
\@booleanfalse\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@sw`is also consulted in various procedures, but we assume its value does not change after `\setup@hook` time.

```
\appdef\setup@hook{%
  \preprintsty@sw{%
   \ps@preprint
   \def\frontmatter@abstractwidth{\textwidth}%
   \def\frontmatter@affiliationfont{\it}%
   \let\section\section@preprintsty
```

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

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

```
   \let\subsection\subsection@preprintsty
   \let\subsubsection\subsubsection@preprintsty
  }{%
   \ps@article
  }%
}%
```

`\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.

```
\def\frontmatter@authorformat{%
```

```
  \skip@\@flushglue
  \@flushglue\z@ plus.3\hsize\relax
  \centering
  \advance\baselineskip\p@
  \parskip11.5\p@\relax
  \@flushglue\skip@
```

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

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

```
}%
```

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

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

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

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

```
}%
```

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

```
\def\frontmatter@above@affiliation@script{%
  \skip@\@flushglue
  \@flushglue\z@ plus.3\hsize\relax
  \centering
  \@flushglue\skip@
  \addvspace{3.5\p@}%
}%
\def\frontmatter@above@affiliation{%
  \preprintsty@sw{}{%
```

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

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

```
  }%
}%
```

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

```
\def\frontmatter@affiliationfont{%
  \small\it
}%
```

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

```
\def\frontmatter@collaboration@above{%
 \preprintsty@sw{%
 }{%
  \parskip1.5\p@\relax
 }%
}%
```

\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.

```
\def\frontmatter@setup{%
 \normalfont
}%
```

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

Note: Spacing from title to author is 23 points base-to-base.

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

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

```
\def\@author@parskip{3\p@}%
\def\frontmatter@makefnmark{%
 \@textsuperscript{%
  \normalfont\@thefnmark
 }%
}%
\def\frontmatter@authorbelow{%
 \addvspace{3\p@}%
}%
```

\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.

```
\def\frontmatter@RRAP@format{%
  \small
  \centering
```

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

```
% \preprintsty@sw{}{\parskip.5ex\relax}%
%

  \everypar{\hbox\bgroup(\@gobble@leavemode@uppercase}%
  \def\par{\@ifvmode{}{\unskip)\egroup\@@par}}%
}%
\def\punct@RRAP{;\egroup\ \hbox\bgroup}%
\def\@gobble@leavemode@uppercase#1#2{\expandafter\MakeTextUppercase}%
```

\frontmatter@PACS@format

```
\def\frontmatter@PACS@format{%
   \addvspace{11\p@}%
   \footnotesize
   \adjust@abstractwidth
   \parindent\z@
   \parskip\z@skip
   \samepage
}%
```

\frontmatter@keys@format

```
\def\frontmatter@keys@format{%
   \footnotesize
   \adjust@abstractwidth
   \parindent\z@
   \samepage
}%
```

\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.

```
\def\ps@titlepage{%
  \def\@oddhead{%
   \hfill
   \preprint@sw{%
    \expandafter\produce@preprints\expandafter{\@preprint}%
   }{}%
  }%
  \let\@evenhead\@oddhead
  \def\@oddfoot{%
   \hb@xt@\z@{\byrevtex\hss}%
   \hfil
   \preprintsty@sw{\thepage}{}%
   \quad\checkindate
   \hfil
  }%
  \let\@evenfoot\@oddfoot
}%
\def\byrevtex{\byrevtex@sw{Typeset by REV\TeX}{}}%
```

\produce@preprints

```
\def\produce@preprints#1{%
 \vtop to \z@{%
  \def\baselinestretch{1}%
  \small
  \let\preprint\preprint@count
  \count@\z@
  #1%
  \@ifnum{\count@>\tw@}{%
   \hbox{%
```

```
    \let\preprint\preprint@hlist
    #1%
    \setbox\z@\lastbox
   }%
  }{%
   \let\preprint\preprint@cr
   \halign{\hfil##\cr#1\crcr}%
   \par
   \vss
  }%
 }%
}%
\def\preprint@cr#1{#1\cr}%
\def\preprint@count#1{\advance\count@\@ne}%
\def\preprint@hlist#1{#1\hbox{, }}%
```

31.3.2 Stacked Heads

All APS journals put a period (.), followed by quad space, after the section number. Also, no hanging section number.

```
\def\@seccntformat#1{\csname the#1\endcsname.\quad}%
\def\@hang@from#1#2#3{#1#2#3}%
```

Note that in the following, we wish to set the section head uppercase, so we use David Carlisle's `\MakeTextUppercase`. However, because this procedure effectively parses its argument (looking for things to *not* translate), it has to be invoked in such a way that the argument of the `\section` command is passed to it as its own argument.

To accomplish this, we use the `\@hangfrom@` hook, which was developed for this purpose.

```
\def\section{%
  \@startsection
    {section}%
    {1}%
    {\z@}%
    {0.8cm \@plus1ex \@minus .2ex}%
    {0.5cm}%
    {%
      \normalfont\small\bfseries
      \centering
    }%
}%
\def\@hangfrom@section#1#2#3{\@hangfrom{#1#2}\MakeTextUppercase{#3}}%
\def\@hangfroms@section#1#2{#1\MakeTextUppercase{#2}}%

\def\subsection{%
  \@startsection
    {subsection}%
    {2}%
    {\z@}%
```

```
    {.8cm \@plus1ex \@minus .2ex}%
    {.5cm}%
    {%
     \normalfont\small\bfseries
     \centering
    }%
}%
\def\subsubsection{%
  \@startsection
    {subsubsection}%
    {3}%
    {\z@}%
    {.8cm \@plus1ex \@minus .2ex}%
    {.5cm}%
    {%
     \normalfont\small\itshape
     \centering
    }%
}%
```

31.3.3 Runin Heads

```
\def\paragraph{%
  \@startsection
    {paragraph}%
    {4}%
    {\parindent}%
    {\z@}%
    {-1em}%
    {\normalfont\normalsize\itshape}%
}%
\def\subparagraph{%
  \@startsection
    {subparagraph}%
    {5}%
    {\parindent}%
    {3.25ex \@plus1ex \@minus .2ex}%
    {-1em}%
    {\normalfont\normalsize\bfseries}%
}%
```

\section@preprintsty
\subsection@preprintsty
\subsubsection@preprintsty

Here are the formatting procedures specific to the preprint style; the only difference is that the heads are flush left instead of centered.

```
\def\section@preprintsty{%
  \@startsection
    {section}%
    {1}%
    {\z@}%
    {0.8cm \@plus1ex \@minus .2ex}%
```

```
    {0.5cm}%
    {%
      \normalfont\small\bfseries
%     \centering
    }%
}%
%\def\@hangfrom@section@preprintsty#1#2#3{\@hangfrom{#1#2}\MakeTextUppercase{#3}}%
\def\subsection@preprintsty{%
  \@startsection
    {subsection}%
    {2}%
    {\z@}%
    {.8cm \@plus1ex \@minus .2ex}%
    {.5cm}%
    {%
     \normalfont\small\bfseries
%    \centering
    }%
}%
\def\subsubsection@preprintsty{%
  \@startsection
    {subsubsection}%
    {3}%
    {\z@}%
    {.8cm \@plus1ex \@minus .2ex}%
    {.5cm}%
    {%
     \normalfont\small\itshape
%    \centering
    }%
}%
```

By default, APS journals set titlepage notes as footnotes.

```
\let\frontmatter@footnote@produce\frontmatter@footnote@produce@footnote
%
```

31.3.4 Table of Contents

The toc will itself make an entry in the toc, but we temporarily turn off toc formatting for the duration.

```
\def\@pnumwidth{1.55em}%
\def\@tocrmarg {2.55em}%
\def\@dotsep{2}%
\def\ltxu@dotsep{4.5pt}%
\setcounter{tocdepth}{3}%
\def\tableofcontents{%
 \addtocontents{toc}{\string\tocdepth@munge}%
```

```
 \print@toc{toc}%
 \addtocontents{toc}{\string\tocdepth@restore}%
}%
\def\tocdepth@munge{%
  \let\l@section@saved\l@section
  \let\l@section\@gobble@tw@
}%
\def\@gobble@tw@#1#2{}%
\def\tocdepth@restore{%
  \let\l@section\l@section@saved
}%
```

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

```
\def\l@part#1#2{\addpenalty{\@secpenalty}%
 \begingroup
  \set@tocdim@pagenum\@tempboxa{#2}%
% \@tempdima 3em %
  \parindent \z@
  \rightskip\tocleft@pagenum plus 1fil\relax
  \skip@\parfillskip\parfillskip\z@
  \addvspace{2.25em plus\p@}%
  \large \bf %
  \leavevmode\ignorespaces#1\unskip\nobreak\hskip\skip@
  \hb@xt@\rightskip{\hfil\unhbox\@tempboxa}\hskip-\rightskip\hskip\z@skip
  \par
  \nobreak %
 \endgroup
}%
```

`\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.

```
\def\tocleft@{\z@}%
\def\tocdim@min{5\p@}%
\def\l@section{%
 \l@@sections{}{section}% Implicit #3#4
}%
\def\l@f@section{%
 \addpenalty{\@secpenalty}%
 \addvspace{1.0em plus\p@}%
 %\bf
}%
\def\l@subsection{%
 \l@@sections{section}{subsection}% Implicit #3#4
}%
\def\l@subsubsection{%
 \l@@sections{subsection}{subsubsection}% Implicit #3#4
}%
```

```
\def\l@paragraph#1#2{}%
\def\l@subparagraph#1#2{}%
```

Activate the auto TOC processing.

```
\let\toc@pre\toc@pre@auto
\let\toc@post\toc@post@auto
```

31.3.5 Default column bottom

All APS journal styles have flush bottoms.

```
\@booleanfalse\raggedcolumn@sw
```

31.3.6 Table alignment style

\tableft@skip@float
\tabmid@skip@float
\tabright@skip@float
\array@row@pre@float
\array@row@pst@float

All APS publications have the same table specification: Scotch rules above and below, centered in column.

```
\def\tableft@skip@float{\z@ plus\hsize}%
\def\tabmid@skip@float{\@flushglue}%
\def\tabright@skip@float{\z@ plus\hsize}%
\def\array@row@pre@float{\hline\hline\noalign{\vskip\doublerulesep}}%
\def\array@row@pst@float{\noalign{\vskip\doublerulesep}\hline\hline}%
```

31.3.7 Footnote formatting

We customize the formatting of footnotes for all APS journals.

\@makefntext

```
\long\def\@makefntext#1{%
 \def\baselinestretch{1}%
 \leftskip1em%
 \parindent1em%
 \noindent
 \nobreak\hskip-\leftskip
 \hb@xt@\leftskip{%
  \hss\@makefnmark\ %
 }%
 #1%
 \par
}%
```

\frontmatter@makefntext

We ensure that frontmatter footnotes format similarly to body footnotes. But we provide our own hypertext anchor, otherwise not provided.

```
\long\def\frontmatter@makefntext#1{%
 \def\baselinestretch{1}%
 \leftskip1em%
 \parindent1em%
 \noindent
 \nobreak\hskip-\leftskip
 \Hy@raisedlink{\hyper@anchorstart{frontmatter.\expandafter\the\csname c@\@mpfn\endcsname}\hype
```

```
 \hb@xt@\leftskip{%
  \hss\@makefnmark\ %
 }%
 #1%
 \par
}%
```

31.3.8 Appendix

\appendix
\@hangfrom@appendix
\@hangfroms@appendix
\@appendixcntformat

```
\prepdef\appendix{%
 \par
 \let\@hangfrom@section\@hangfrom@appendix
%\let\@hangfroms@section\@hangfroms@appendix
 \let\@sectioncntformat\@appendixcntformat
}%
\def\@hangfrom@appendix#1#2#3{%
 #1%
 \@if@empty{#2}{%
  #3%
 }{%
  #2\@if@empty{#3}{}{:\ #3}%
 }%
}%
\def\@hangfroms@appendix#1#2{%
 #1#2%
}%
\def\@appendixcntformat#1{\appendixname\ \csname the#1\endcsname}%
```

31.3.9 Bibliography

Customize REVTEX for the journal substyle; this task requires three components: the BIBTEX `apsrev.bst` and `apsrmp.bst` style files, and customizations of the `thebibliography` environment.

\@bibstyle

Define the argument of the `\bibliographystyle` command (if the document does not do so). The user must have installed a `.bst` file of the corresponding name. This file will then be used by BIBTEX when compiling the document's `.bbl` file.

To generate `apsrev.bst`, use `custom-bib` version 4.21 or later. Run the `.bst` generator, `makebst.tex`, and accept all defaults, with the following exceptions:

1. LANGUAGE FIELD: **l**: `lang`—Use language field to switch hyphenation patterns for title
2. PRESENTATIONS: **b**: `pres,pres-bf`—Presentation, speaker bold face
3. ORDERING OF REFERENCES: **c**: `seq-no`—Citation order (unsorted, like unsrt.bst)

4. ORDER ON VON PART: **x**: `vonx`—Sort without von part (de la Maire after Mahone)
5. AUTHOR NAMES: **i**: `nm-init,ed-au`—Initials + surname (J. F. Smith)
6. POSITION OF JUNIOR: *****: `jnrlst`—Junior comes last as Smith, John, Jr.
7. TYPEFACE FOR AUTHORS IN LIST OF REFERENCES: **u**: `nmft,nmft-def`—User defined author font (`\bibnamefont`)
8. FONT FOR FIRST NAMES: **u**: `fnm-def`—First names in user defined font (`\bibfnamefont`)
9. EDITOR NAMES IN INCOLLECTION ETC: **a**: `nmfted`—Editors incollection like authors font
10. FONT FOR 'AND' IN LIST: **r**: `nmand-rm`—'And' in normal font (JONES and JAMES)
11. FONT OF CITATION LABELS IN TEXT: **u**: `lab,lab-def`—User defined citation font (`\citenamefont`)
12. FONT FOR 'AND' IN CITATIONS: **r**: `and-rm`—Cited 'and' in normal font
13. DATE FORMAT: *****: `yr-par`—Date in parentheses as (May 1993)
14. DATE EMPTY: **-**: `date-nil-x`—If date is empty, then do not produce the surrounding punctuation (parens, brackets, colon, comma)
15. TITLE OF ARTICLE: **d**: `tit-qq`—Title and punctuation in double quotes ("Title," ..)
16. INPROCEEDINGS CHAPTER AND PAGES, LIKE INBOOK: **-**: `inproceedings-chapter`—produce pages after chapter, just as in InBook
17. TITLE PRESENT IN ARTICLE, INCOLLECTION, AND INPROCEEDINGS: **x**: `jtit-x`—Title is ignored
18. INPROCEEDINGS CHAPTER AND PAGES, LIKE INBOOK: **y**: `inproceedings-chapter`—produce pages after chapter, just as in InBook
19. ARTICLE BOOKTITLE PRESENT: : `article-booktitle`—format booktitle
20. ARTICLE SERIES PRESENT: : `article-series`—article can has series
21. JOURNAL NAME FONT: **r**: `jttl-rm`—Journal name normal font
22. JOURNAL NAME WITH ADDRESS: **y**: `journal-address`—Include address field (in parentheses) along with journal name
23. BOOK TITLE FIELDS: **y**: `book-bt`—Field 'booktitle', or if absent field 'title', is book title

24. THESIS TITLE OPTIONAL: : `thesis-title-o`—Title is optional: no warning issued if empty

25. TECHNICAL REPORT TITLE: **b**: `trtit-b`—Tech. report title like books

26. TECHNICAL REPORT INSTITUTION: : `techreport-institution-par`—format tech report institution like book publisher

27. JOURNAL VOLUME: **b**: `vol-bf`—Volume bold as **vol**(num)

28. JOURNAL VOL AND NUMBER: **x**: `vnum-x`—Journal vol, without number as 34

29. VOLUME PUNCTUATION: **c**: `volp-com`—Volume with comma as vol(num), ppp

30. PAGE NUMBERS: **f**: `jpg-1`—Only start page number

31. BOOK EDITOR W/O AUTHOR: : `book-editor-booktitle`—Book permits empty author, produces title before editor in this case

32. INBOOK PERMITS TITLE, BOOKTITLE, AUTHOR, EDITOR: **a**: `inbook-editor-booktitle`—Allow using both title/booktitle, both author/editor

33. CONFERENCE ADDRESS FOR BOOK, INBOOK, INCOLLECTION, INPROCEEDINGS, PROCEEDINGS: **a**: `bookaddress`—Italic booktitle followed by bookaddress in roman

34. NUMBER AND SERIES FOR BOOK, INBOOK, INCOLLECTION, INPROCEEDINGS, PROCEEDINGS: *: `num-xser`—Allows number without series and suppresses word "number"

35. WORD NUMBER CAPITALIZED FOR NUMBER AND SERIES: **c**: `number-cap`—Capitalize word 'number' as: "Number 123"

36. WORD CHAPTER CAPITALIZED: **c**: `chapter-cap`—Capitalize word 'chapter' as: 'Chapter 42'

37. COMBINING NUMBER AND SERIES: **x**: `series-number`—Series number as: 'Springer Lecture Notes No. 125'

38. POSITION OF NUMBER AND SERIES: **b**: `numser-booktitle`—After book title and conference address, and before editors

39. VOLUME AND SERIES FOR BOOKS/COLLECTIONS: **s**: `ser-vol`—Series, vol. 23

40. VOLUME AND SERIES FORMATTING: **y**: `ser-rm`—format series roman , even when used with volume

41. WORD VOLUME CAPITALIZED FOR VOLUME AND SERIES: **y**: `volume-cap`—Capitalize word 'volume', as: 'Volume 7 in Lecture Series'

42. POSITION OF VOLUME AND SERIES FOR INCOLLECTION, INBOOK, AND INPROCEEDINGS: **e**: `ser-ed`—Series and volume after booktitle and before editors

43. JOURNAL NAME PUNCTUATION: **x**: `jnm-x`—Space after journal name

44. PAGES IN BOOK: *: `pg-bk,book-chapter-pages`—As chapter and page: chapter 42, page 345

45. PUBLISHER IN PARENTHESES: **d**: `pub-date`—Publisher with address and date in parentheses (Oxford, 1994)

46. EMPTY PUBLISHER PARENTHESES: **y**: `ay-empty-pub-parens-x`—eliminate parentheses altogether if nothing inside

47. PUBLISHER POSITION: : `pre-pub`—Publisher before volume, chapter, pages

48. : : `pre-edn`—Edition before publisher

49. : **p**: `pre-pub,pre-edn`—Edition, publisher, volume, chapter, pages

50. ISBN NUMBER: *: `isbn`—Include ISBN for books, booklets, etc.

51. ISSN NUMBER: *: `issn`—Include ISSN for periodicals

52. DOI NUMBER: **a**: `doi-link,doi`—Doi forms a link to the publication, anchored to the volume or title

53. EDITOR IN COLLECTIONS: **b**: `edby`—In booktitle, edited by .. (where .. is names)

54. PUNCTUATION BETWEEN SECTIONS (BLOCKS): **c**: `blk-com`—Comma between blocks

55. FINAL PUNCTUATION: **c**: `fin-endbibitem`—Command at end instead of period

56. ABBREVIATE WORD 'PAGES': **a**: `pp`—'Page' abbreviated as p. or pp.

57. ABBREVIATE WORD 'EDITORS': **a**: `ed`—'Editor' abbreviated as ed. or eds.

58. OTHER ABBREVIATIONS: **a**: `abr`—Abbreviations of such words

59. ABBREVIATION FOR 'EDITION': **a**: `ednx`—'Edition' abbreviated as 'ed'

60. EDITION NUMBERS: **n**: `ord`—Numerical editions as 1st, 2nd, 3rd, etc

61. STORED JOURNAL NAMES: **a**: `jabr`—Abbreviated journal names

62. FONT OF 'ET AL': **i**: `etal-it`—Italic et al

63. ADDITIONAL REVTeX DATA FIELDS: **r**: `revdata,eprint,url,url-blk,translation`—Include REVTeX data fields collaboration, eid, eprint, archive, url, translation

64. SLACcitation FIELD: : `SLACcitation`—Produce SLACcitation field

65. NUMPAGES DATA FIELD: *: `numpages-x`—Do not include numpages field

66. URL ADDRESS: *: `url,url-prefix-x`—URL without prefix (default: 'URL ')

67. REFERENCE COMPONENT TAGS: **b**: `bibinfo`—Reference component tags like `\bibinfo`in the content of `\bibitem`

68. ELEMENT TAGS: **b**: `bibfield`—Element tags like `\bibfield`in the content of `\bibitem`

69. COMPATIBILITY WITH PLAIN TEX: *: `nfss`—Use LaTeX commands which may not work with Plain TeX

A file `apsrev.dbj` file equivalent to the following should result:

```
%\input docstrip
%\preamble
%----------------------------------------
%*** REVTeX-compatible Phys Rev 2010-02-12 ***
%\endpreamble
%\postamble
%End of customized bst file
%\endpostamble
%\keepsilent
%\askforoverwritefalse
%\def\MBopts{\from{merlin.mbs}{%
%  head,\MBopta}
%\from{physjour.mbs}{\MBopta}
%\from{geojour.mbs}{\MBopta}
%\from{photjour.mbs}{\MBopta}
%\from{merlin.mbs}{tail,\MBopta}}
%\def\MBopta{%
%  ay,%: Author-year with some non-standard interface
%  nat,%: Natbib for use with natbib v5.3 or later
%  lang,%: Use language field to switch hyphenation patterns for title
%  pres,pres-bf,%: Presentation, speaker bold face
%  seq-no,%: Citation order (unsorted, only meaningful for numericals)
%  vonx,%: Sort without von part (de la Maire after Mahone)
%  nm-init,ed-au,%: Initials + surname (J. F. Smith)
%  jnrlst,%: Junior comes last as Smith, John, Jr.
%  nmft,nmft-def,%: User defined author font (\bibnamefont)
%  fnm-def,%: First names in user defined font (\bibfnamefont)
%  nmfted,%: Editors incollection like authors font
%  nmand-rm,%: 'And' in normal font (JONES and JAMES)
```

```
%  lab,lab-def,%: User defined citation font (\citenamefont)
%  and-rm,%: Cited ‘and’ in normal font
%  keyxyr,%: Year blank when KEY replaces missing author (for natbib 7.0)
%  blkyear,%: Missing date left blank
%  yr-par,%: Year in parentheses as (1993)
%  dtrev,%: Date as year month
%  date-nil-x,%: If date is empty, then do not produce the surrounding punctuation (parens, bracke
%  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-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{apsrev4-2.bst}{\MBopts}}
%\endbatchfile
%
```

31.3.10 Comparing apsrev.bst and apsrmp.bst

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

- `seq-no`— Citation order (unsorted, like unsrt.bst)
- `nm-init,ed-au`— Initials + surname (J. F. Smith)
- `blkyear`— Missing date left blank
- `date-nil-x`— If date is empty, then do not produce the surrounding punctuation (parens, brackets, colon, comma)
- `inproceedings-chapter`— produce pages after chapter, just as in InBook
- `techreport-institution-par`— format tech report institution like book publisher
- `vnum-x`— Journal vol, without number as '34'
- `pub-date`— Publisher with address and date in parentheses (Oxford, 1994)
- `pre-pub`— Edition, publisher, volume, chapter, pages. Note that both use guard code pre-edn.

`apsrmp.dbj` has the following guard codes, which `apsrev.dbj` does not:

- `nm-rev1`— Only first name reversed, initials (AGU style: Smith, J. F., H. K. Jones)
- `dt-beg`— Date after authors
- `vnum-sp`— Journal vol (num) as '34 (2)'
- `pp-last`— Pages at end, but before any notes

- `pub-par`— Publisher in parentheses
- `school-par`— School/address in parens: '(school, address)'
- `bkedcap`— 'Name Editor,' as above, editor upper case
- `and-com`— Comma even with 2 authors as 'Tom, and Harry'

We ensure that the journal substyle has the first word in the matter by installing the (default) APS code later on (see Section 31.6).

`\authoryear@sw` Numerical citations: default value of `\authoryear@sw` is false.

```
\@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.

```
\appdef\setup@hook{%
 \bibpunct{[}{]}{,}{n}{}{,}%
}%
```

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

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

`\bibsection` We define the sectioning command to use when starting the bibliography.

```
\appdef\setup@hook{%
 \def\bibsection{%
  \par
  \onecolumngrid@push
  \begingroup
   \baselineskip26\p@
   \bib@device{\textwidth}{245.5\p@}%
  \endgroup
  \nobreak\@nobreaktrue
  \addvspace{19\p@}%
  \par
  \onecolumngrid@pop
 }%
}%
```

\bib@device We define the sectioning command to use when starting the bibliography.

\bibpreamble
\bibsep
\newblock

```
\def\bib@device#1#2{%
 \hb@xt@\z@{%
  \hb@xt@#1{%
   \hfil
   \phantomsection
   \addcontentsline {toc}{section}{\protect\numberline{}\refname}%
%  \hyper@anchorstart {\@currentHref }%
   \hb@xt@#2{%
    \skip@\z@\@plus-1fil\relax
                            \leaders\hrule height.25 \p@ depth.25 \p@ \hskip\z@\@plus1fil
    \hskip\skip@
    \hskip\z@\@plus0.125fil\leaders\hrule height.375\p@ depth.375\p@ \hskip\z@\@plus0.75fil \hs
    \hskip\skip@
    \hskip\z@\@plus0.25 fil\leaders\hrule height.5  \p@ depth.5  \p@ \hskip\z@\@plus0.5 fil \hs
    \hskip\skip@
    \hskip\z@\@plus0.375fil\leaders\hrule height.625\p@ depth.625\p@ \hskip\z@\@plus0.25fil \hs
 %  \hskip\skip@
 %  \hfil
   }%
%  \hyper@anchorend
   \hfil
  }%
  \hss
 }%
}%
\appdef\setup@hook{%
 \let\bibpreamble\@empty
 \bibsep\z@\relax
 \def\newblock{\ }%
}%
```

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

```
\appdef\setup@hook{%
 \def\bibfont{%
  \small
  \@clubpenalty\clubpenalty
 }%
}%
```

31.3.11 Index

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

```
\newenvironment{theindex}{%
 \columnseprule \z@
 \columnsep 35\p@
 \c@secnumdepth-\maxdimen
 \onecolumngrid@push
```

```
 \section{\indexname}%
 \thispagestyle{plain}%
 \parindent\z@
 \parskip\z@ plus.3\p@\relax
 \let\item\@idxitem
 \onecolumngrid@pop
}{%
%\onecolumngrid@pop
}%
%
\def\@idxitem{\par\hangindent 40\p@}%
%
\def\subitem{\par\hangindent 40\p@ \hspace*{20\p@}}%
%
\def\subsubitem{\par\hangindent 40\p@ \hspace*{30\p@}}%
%
\def\indexspace{\par \vskip 10\p@ plus5\p@ minus3\p@\relax}%
```

31.4 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.

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

31.5 Typesize-Specific Code

After this society file is read in, we will process the `\@pointsize`-specific code. Here we define the default.

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

Note: the convention in REVTEX and its substyles is that the substyle must not override any explicit class options declared by the document. This means that the various Booleans of Section 9 may be assigned here only if they are still undefined at this point.

For the APS, we supply code specific to journals PRA, PRB, PRC, PRD, PRE, PRL, PRX, PRAPPLIED, PRMATERIALS, PRFLUIDS, PRAB (was PRSTAB), PRPER (was PRSTPER), and RMP. At present, they are identical, with the exception of PRL and RMP. We also introduce a new generic physrev style now that all of the Phys. Rev. journals are identical In 4.2, we make the inclusion of titles in the bibliography the default

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.

31.5.1 pra

There is no code specific to pra.

```
\def\rtx@apspra{%
 \class@info{APS journal PRA selected}%
}%
```

31.5.2 prb

There is no code specific to prb.

```
\def\rtx@apsprb{%
 \class@info{APS journal PRB selected}%
}%
```

31.5.3 prc

There is no code specific to prc.

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

31.5.4 prd

There is no code specific to prd.

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

31.5.5 pre

There is no code specific to pre.

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

31.5.6 prl

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

```
 \let\frontmatter@footnote@produce\frontmatter@footnote@produce@endnote
 \@booleanfalse\acknowledgments@sw
 \appdef\setup@hook{%
```

```
  \def\bibsection{%
   \par
   \begingroup
    \baselineskip26\p@
    \bib@device{\hsize}{72\p@}%
   \endgroup
   \nobreak\@nobreaktrue
   \addvspace{19\p@}%
  }%
 }%
```

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.

```
 \appdef\setup@hook{%
  \lengthcheck@sw{%
   \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}%
%
```

```
  }{}%
 }%
```

A PRL does not have numbered sections.

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

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

```
 \appdef\setup@hook{%
  \@ifnum{\@pointsize=10\relax}{%
   \lengthcheck@sw{%
    \def\large{%
     \@setfontsize\large{12.5}{14\p@}%
    }%
    \def\normalsize{%
     \@setfontsize\normalsize{10.5}\@xiipt
     \abovedisplayskip 6\p@ \@plus6\p@ \@minus5\p@
     \belowdisplayskip \abovedisplayskip
     \abovedisplayshortskip  \abovedisplayskip
     \belowdisplayshortskip \abovedisplayskip
     \let\@listi\@listI
    }%
    \def\small{%
     \@setfontsize\small{9.5}\@xipt
     \abovedisplayskip 5\p@ \@plus5\p@ \@minus4\p@
     \belowdisplayskip \abovedisplayskip
     \abovedisplayshortskip  \abovedisplayskip
     \belowdisplayshortskip \abovedisplayskip
     \let\@listi\@listI
```

```
    }%
    \DeclareMathSizes{12.5}{12.5}{9}{6}%
    \DeclareMathSizes{10.5}{10.5}{7.5}{5}%
    \DeclareMathSizes{9.5}{9.5}{7.0}{5}%
   }{%
    \def\normalsize{%
     \@setfontsize\normalsize\@xpt\@xiipt
     \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
     \belowdisplayskip \abovedisplayskip
     \abovedisplayshortskip  \abovedisplayskip
     \belowdisplayshortskip \abovedisplayskip
     \let\@listi\@listI
    }%
   }%
  }{}%
 }%
 \textheight = 694.0\p@
```

End of `prl` code.

```
}%
```

31.5.7 prper

There is no code specific to `prper`

```
\def\rtx@apsprper{%
 \class@info{APS journal PRPER selected}%
}%
```

31.5.8 prab

There is no code specific to `prab`.

```
\def\rtx@apsprab{%
 \class@info{APS journal PRAB selected}%
}%
```

31.5.9 prx

There is no code specific to `prx`.

```
\def\rtx@apsprx{%
 \class@info{APS journal PRX selected}%
}%
```

31.5.10 prapplied

There is no code specific to `prapplied`.

```
\def\rtx@apsprapplied{%
 \class@info{APS journal PRApplied selected}%
}%
```

31.5.11 prmaterials

There is no code specific to prmaterials.

```
\def\rtx@apsprmaterials{%
 \class@info{APS journal PRMaterials selected}%
}%
```

31.5.12 prfluids

PRFluids uses a one-column format for journal format, but if authors want this, they should use the onecolumn option and not the reprint option. Parsing of documentclass options is rather involved and hard to control precisely enough to have the correct behavior using the reprint option.

```
\def\rtx@apsprfluids{%
 \class@info{APS journal PRFluids selected}%
 \@booleanfalse\titlepage@sw
}%
```

31.5.13 physrev

There is no code specific to physrev.

```
\def\rtx@apsphysrev{%
 \class@info{APS unified Physical Review journal style selected}%
%    \begin{macrocode}
}%
```

31.5.14 rmp

If this option has been selected, we will read in the needed code from the file apsrmp.rtx.

31.6 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.

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

\@bibdataout@init
\@bibdataout@aps

Procedure \@bibdataout@aps has the job of writing the control record into the job's \jobnamerevtex4-2.dtx.bib file, where it will adjust the options to revtex4-2.dtx.bst processing. It is installed into the initialization procedure \@bibdataout@init, and its meaning is set by the society (APS) and journal. For all but RMP, we select the Physical Review style. For the latter case, we change the meaning, per the code in apsrmp.rtx.

```
\appdef\@bibdataout@rev{\@bibdataout@aps}%
\def\@bibdataout@aps{%
 \immediate\write\@bibdataout{%
```

An entry that controls processing of the revtex4-2.dtx.bst file has entry type `@CONTROL`.

```
3198  @CONTROL{%
3199   apsrev42Control%
```

Say whether we want long bibliography style (the default), or the abbreviated style. Use binary flags on control.* flags in bst file to set appropriate parameters author = 08 corresponds to initials, jrnlst editor = 1 corresponds to format identical to authors title = 0 means to include title in journal references if present; title ="" means omit the title even if present (this should be the only difference between long and short bib styles) year = 1 corresponds to truncate page = 0 corresponds to using single page number rather than a range

```
3200   \longbibliography@sw{%
3201    ,author="08",editor="1",pages="0",title="0",year="1"%
3202   }{%
3203    ,author="08",editor="1",pages="0",title="",year="1"%
3204   }%
3205  }%
3206 }%
```

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

```
3207 \if@filesw
3208  \immediate\write\@auxout{\string\citation{apsrev42Control}}%
3209 \fi
3210 }%
```

`\place@bibnumber` `\@bibstyle` We install code that will select the presentation for `\bibitem`s and govern the BibTeX processing.

```
3211 \let\place@bibnumber\place@bibnumber@inl
3212 \def\@bibstyle{apsrev\substyle@post}%

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

31.7 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.

```
\appdef\setup@hook{%
 \@ifx{\place@bibnumber\place@bibnumber@sup}{%
  \footinbib@sw{}{%
   \class@warn{Citations are superscript numbers: footnotes must be endnotes; changing to that
   \@booleantrue\footinbib@sw
  }%
 }{}%
}%
```

Here ends the substyle for society APS.

```
%</aps>
```

32 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.

```
%<*rmp>
```

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

```
\ifx\undefined\substyle@ext
 \def\@tempa{%
  \endinput
  \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
 }%
 \expandafter\else
  \def\@tempa{}%
 \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.

```
\@ifxundefined\@journal{%
```

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

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

Log the journal substyle.

```
 \class@info{APS journal RMP selected}%
```

32.1 Frontmatter

We assign the titlepage style for RMP; a document instance may override by invoking one of the class options of REVTEX.

```
\clo@groupedaddress
```

\frontmatter@setup

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

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

```
\def\PACS@warn{RMP documents do not display PACS and PACS are obsolete. Your \string\pacs\space
```

\frontmatter@title@above
\frontmatter@title@format
\frontmatter@title@below

```
\def\frontmatter@title@above{}%
\def\frontmatter@title@format{\Large\bfseries\raggedright}% HelveticaNeue-Medium(Italic) 14pt.
\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 LaTeX default, which gives very poor results.

Note: author font is 9.8bp. 19.2bp/14.3bp above/below.

```
\def\frontmatter@authorformat{%
 \preprintsty@sw{\vskip0.5pc\relax}{}%
 \@tempskipa\@flushglue
 \@flushglue\z@ plus.8\hsize
 \raggedright\advance\leftskip.5in\relax
 \@flushglue\@tempskipa
 \parskip\z@skip
 \@totalleftmargin\leftskip
}%
```

\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

```
\def\frontmatter@affiliationfont{% Helvetica 9/10.2
 \small\slshape\selectfont\baselineskip10.5\p@\relax
 \@tempskipa\@flushglue
 \@flushglue\z@ plus.8\hsize
 \raggedright\advance\leftskip.5in\relax
 \@flushglue\@tempskipa
 \@totalleftmargin\leftskip
 \let\def@after@address\def@after@address@empty
}%
```

```
\def\frontmatter@above@affilgroup{\addvspace{7.2\p@}}% additional leading above an author
\def\frontmatter@above@affiliation{\addvspace{5.3\p@}}%
\def\frontmatter@above@affiliation@script{}%
```

Set up the default RMP style for title block authors and affiliations. We assign the titlepage style for RMP; a document instance may override by invoking one of the class options of REVTEX.

This command should override the effect of the corresponding command in the society substyle, and any document class option bearing on same will in turn override.

```
\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.

```
\def\frontmatter@RRAP@format{%
  \addvspace{7.3\p@}%
  \small
  \raggedright\advance\leftskip.5in\relax
 \@totalleftmargin\leftskip
}%
\def\produce@RRAP#1{%
  \@if@empty{#1}{}{%
   \@ifvmode{\leavevmode}{}%
   \unskip(\ignorespaces#1\unskip)\quad
  }%
}%
```

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

```
\def\frontmatter@abstractheading{%
 \preprintsty@sw{%
  \begingroup
   \centering\large
   \abstractname
   \par
  \endgroup
  \vspace{.5pc}%
 }{}%
}%
```

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

```
\def\frontmatter@abstractfont{%
 \footnotesize
 \hsize360\p@
 \leftskip=0.5in
 \parindent\z@
 \@totalleftmargin\leftskip
}%
```

\frontmatter@preabstractspace
\frontmatter@postabstractspace

Space above and space below abstract in title block. Should be 22/36 points base-to-base.

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

FIXME: Not done: PACS. FIXME: TOC: Head is same as

33 :

HelveticaNeue 8.98. 32/22bp b-b above/below, Body: TimesTen 8/10.5.

33.1 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.

```
\appdef\setup@hook{%
 \preprintsty@sw{}{%
  \def\normalsize{%
   \@setsize\normalsize{12pt}\xpt\@xpt
   \abovedisplayskip 10\p@ plus2\p@ minus5\p@
   \belowdisplayskip \abovedisplayskip
   \abovedisplayshortskip  \abovedisplayskip
   \belowdisplayshortskip \abovedisplayskip
   \let\@listi\@listI
  }%
 }%
}%
```

Footnote mods:

```
\footnotesep 9.25pt
\skip\footins 36pt plus 4pt minus 12pt
\def\footnoterule{%
 \dimen@\skip\footins\divide\dimen@\thr@@
 \kern-\dimen@\hrule width.5in\kern\dimen@
}%
```

33.2 Sectioning

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

```
\def\secnums@rtx{%
 \@ifxundefined\thepart{%
  \def\thepart{\Roman{part}}%
 }{}%
 \@ifxundefined\thesection{%
  \def\thesection       {\Roman{section}}%
  \def\p@section        {}%
 }{}%
```

```
\@ifxundefined\thesubsection{%
 \def\thesubsection    {\Alph{subsection}}%
 \def\p@subsection     {\thesection.}%
}{}%
\@ifxundefined\thesubsubsection{%
 \def\thesubsubsection {\arabic{subsubsection}}%
 \def\p@subsubsection  {\thesection.\thesubsection.}%
}{}%
\@ifxundefined\theparagraph{%
 \def\theparagraph     {\alph{paragraph}}%
 \def\p@paragraph      {\thesection.\thesubsection.\thesubsubsection.}%
}{}%
\@ifxundefined\thesubparagraph{%
 \def\thesubparagraph  {\arabic{subparagraph}}%
 \def\p@subparagraph   {\thesection.\thesubsection.\thesubsubsection.\theparagraph.}%
}{}%
}%
```

In RMP, put a period (.), followed by 'nut space', after the section number. Also, hang the section number (the LaTeX default).

```
\def\@seccntformat#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.

```
\def\section{%
 \@startsection{section}{1}{\z@}{0.8cm plus1ex minus.2ex}{0.4cm}%
 {%
  \small\sffamily\bfseries\selectfont
  \raggedright
  \parindent\z@
 }%
}%
\def\@hangfrom@section#1#2#3{\@hangfrom{#1#2}\MakeTextUppercase{#3}}%
\def\@hangfroms@section#1#2{#1\MakeTextUppercase{#2}}%
\def\subsection{%
 \@startsection{subsection}{2}{\z@}{0.8cm plus1ex minus.2ex}{0.4cm}%
 {%
  \small\sffamily\bfseries
  \raggedright
  \parindent\z@
 }%
}%
\def\subsubsection{%
 \@startsection{subsubsection}{3}{\z@}{.8cm plus1ex minus.2ex}{0.4cm}%
 {%
  \small\sffamily\selectfont
```

```
    \raggedright
    \parindent\z@
   }%
  }%
  \def\paragraph{%
   \@startsection{paragraph}{4}{\z@}{.8cm plus1ex minus.2ex}{-1em}%
   {%
    \small\slshape\selectfont
    \raggedright
    \parindent\z@
   }%
  }%
  \def\subparagraph{%
   \@startsection{subparagraph}{4}{\parindent}{3.25ex plus1ex minus.2ex}{-1em}%
   {\normalsize\bfseries\selectfont}%
  }%
%
  \setcounter{tocdepth}{4}% FIXME: has no effect
```

`\appendix` `\@hangfrom@appendix` `\@hangfroms@appendix` `\@appendixcntformat`

```
\appdef\appendix{%
 \let\@hangfrom@section\@hangfrom@appendix
 \let\@sectioncntformat\@appendixcntformat
}%
\def\@hangfrom@appendix#1#2#3{%
 #1%
 \@if@empty{#2}{%
  #3%
 }{%
  #2\@if@empty{#3}{}{:\ #3}%
 }%
}%
\def\@hangfroms@appendix#1#2{%
 #1\appendixname\@if@empty{#2}{}{:\ #2}%
}%
\def\@appendixcntformat#1{\appendixname\ \csname the#1\endcsname}%
```

33.3 Figure and Table Caption Formatting

`\@makecaption`

```
\setlength\belowcaptionskip{2\p@}
\long\def\@makecaption#1#2{%
  \vskip\abovecaptionskip
  \vbox{%
   \flushing
   \small\rmfamily
   \noindent
   #1\@caption@fignum@sep#2\par
  }%
```

```
3406   \vskip\belowcaptionskip
3407 }%
3408 \def\@caption@fignum@sep{\nobreak\hskip.5em plus.2em\ignorespaces}%
```

33.4 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. PRESENTATIONS: **b**: `pres,pres-bf`—Presentation, speaker bold face
5. ORDER ON VON PART : **x**: `vonx`—Sort without von part (de la Maire after Mahone)
6. AUTHOR NAMES: **a**: `nm-rev1`—Only first name reversed, initials (AGU style: Smith, J. F., H. K. Jones)
7. POSITION OF JUNIOR : *****: `jnrlst`—Junior comes last as Smith, John, Jr.
8. TYPEFACE FOR AUTHORS IN LIST OF REFERENCES: **u**: `nmft,nmft-def`—User defined author font (`\bibnamefont`)
9. FONT FOR FIRST NAMES : **u**: `fnm-def`—First names in user defined font (`\bibfnamefont`)
10. EDITOR NAMES IN INCOLLECTION ETC: **a**: `nmfted`—Editors incollection like authors font
11. FONT FOR 'AND' IN LIST: **r**: `nmand-rm`—'And' in normal font (JONES and JAMES)
12. FONT OF CITATION LABELS IN TEXT : **u**: `lab,lab-def`—User defined citation font (`\citenamefont`)

13. FONT FOR 'AND' IN CITATIONS : **r**: `and-rm`—Cited 'and' in normal font
14. LABEL WHEN AUTHORS MISSING : *: `keyxyr`—Year blank when KEY replaces missing author (for natbib 7.0)
15. DATE POSITION: **b**: `dt-beg`—Date after authors
16. DATE FORMAT : **m**: `yr-com`—Date preceded by comma as ', 1993'
17. INCLUDE MONTHS: **m**: `aymth`—Include month in date
18. REVERSED DATE : **r**: `dtrev`—Date as year month
19. TRUNCATE YEAR : *: `note-yr`—Year text full as 1990–1993 or 'in press'
20. TITLE OF ARTICLE: **d**: `tit-qq`—Title and punctuation in double quotes ("Title," ..)
21. TITLE PRESENT IN ARTICLE, INCOLLECTION, AND INPROCEEDINGS: **x**: `jtit-x`—Title is ignored
22. INPROCEEDINGS CHAPTER AND PAGES, LIKE INBOOK: **y**: `inproceedings-chapter`—produce pages after chapter just as in InBook
23. ARTICLE BOOKTITLE PRESENT: **?**: `article-booktitle`—format booktitle
24. ARTICLE SERIES PRESENT: **?**: `article-series`—article can has series
25. JOURNAL NAME FONT: **r**: `jttl-rm`—Journal name normal font
26. JOURNAL NAME WITH ADDRESS: **y**: `journal-address`—Include address field (in parentheses) along with journal name
27. BOOK TITLE FIELDS: **y**: `book-bt`—Field 'booktitle', or if absent field 'title', is book title
28. THESIS TITLE OPTIONAL: **?**: `thesis-title-o`—Title is optional: no warning issued if empty
29. TECHNICAL REPORT TITLE: **b**: `trtit-b`—Tech. report title like books
30. JOURNAL VOLUME: **b**: `vol-bf`—Volume bold as **vol**(num)
31. JOURNAL VOL AND NUMBER: **s**: `vnum-sp`—Journal vol (num) as 34 (2)
32. VOLUME PUNCTUATION: **c**: `volp-com`—Volume with comma as vol(num), ppp
33. PAGE NUMBERS: **f**: `jpg-1`—Only start page number
34. POSITION OF PAGES: **e**: `pp-last`—Pages at end but before any notes

35. BOOK EDITOR W/O AUTHOR: : `book-editor-booktitle`—Book permits empty author, produces title before editor in this case

36. INBOOK PERMITS TITLE, BOOKTITLE, AUTHOR, EDITOR: **a**: `inbook-editor-booktitle`—Allow using both title/booktitle, both author/editor

37. CONFERENCE ADDRESS FOR BOOK, INBOOK, INCOLLECTION, INPROCEEDINGS, PROCEEDINGS: **a**: `bookaddress`—Italic booktitle followed by bookaddress in roman

38. NUMBER AND SERIES FOR BOOK, INBOOK, INCOLLECTION, INPROCEEDINGS, PROCEEDINGS: *: `num-xser`—Allows number without series and suppresses word "number"

39. WORD NUMBER CAPITALIZED FOR NUMBER AND SERIES: **c**: `number-cap`—Capitalize word 'number' as: "Number 123"

40. WORD CHAPTER CAPITALIZED: **c**: `chapter-cap`—Capitalize word 'chapter' as: 'Chapter 42'

41. COMBINING NUMBER AND SERIES: **x**: `series-number`—Series number as: 'Springer Lecture Notes No. 125'

42. POSITION OF NUMBER AND SERIES: **b**: `numser-booktitle`—After book title and conference address, and before editors

43. VOLUME AND SERIES FOR BOOKS: **s**: `ser-vol`—Series, vol. 23

44. VOLUME AND SERIES FORMATTING: **y**: `ser-rm`—format series roman , even when used with volume

45. WORD VOLUME CAPITALIZED FOR VOLUME AND SERIES: **y**: `volume-cap`—Capitalize word 'volume', as: 'Volume 7 in Lecture Series'

46. POSITION OF VOLUME AND SERIES FOR INCOLLECTION, INBOOK, AND INPROCEEDINGS: **e**: `ser-ed`—Series and volume after booktitle and before editors

47. JOURNAL NAME PUNCTUATION: **x**: `jnm-x`—Space after journal name

48. PAGES IN BOOK: *: `pg-bk,book-chapter-pages`—As chapter and page: chapter 42, page 345

49. PUBLISHER IN PARENTHESES: **p**: `pub-par`—Publisher in parentheses

50. EMPTY PUBLISHER PARENTHESES: **y**: `ay-empty-pub-parens-x`—eliminate parentheses altogether if nothing inside

51. PUBLISHER POSITION: **e**: `pre-edn`—Edition before publisher

52. SCHOOL: **p**: `school-par`—school/address in parens: '(school, address)'

53. ISBN NUMBER: *****: `isbn`—Include ISBN for books, booklets, etc.

54. ISSN NUMBER: *****: `issn`—Include ISSN for periodicals

55. DOI NUMBER: **a**: `doi-link,doi`—Doi forms a link to the publication, anchored to the volume or title

56. 'EDITOR' AFTER NAMES: **a**: `bkedcap`—'Name Editor,' as above, editor upper case

57. EDITOR IN COLLECTIONS: **b**: `edby`—In booktitle, edited by .. (where .. is names)

58. PUNCTUATION BETWEEN SECTIONS : **c**: `blk-com`—Comma between blocks

59. FINAL PUNCTUATION: **c**: `fin-endbibitem`—Command at end instead of period

60. ABBREVIATE WORD 'PAGES' : **a**: `pp`—'Page' abbreviated as p. or pp.

61. ABBREVIATE WORD 'EDITORS': **a**: `ed`—'Editor' abbreviated as ed. or eds.

62. OTHER ABBREVIATIONS: **a**: `abr`—Abbreviations of such words

63. ABBREVIATION FOR 'EDITION' : **a**: `ednx`—'Edition' abbreviated as 'ed'

64. EDITION NUMBERS: **n**: `ord`—Numerical editions as 1st, 2nd, 3rd, etc

65. STORED JOURNAL NAMES: **a**: `jabr`—Abbreviated journal names

66. COMMA BEFORE 'AND': **c**: `and-com`—Comma even with 2 authors as 'Tom, and Harry'

67. FONT OF 'ET AL': **i**: `etal-it`—Italic et al

68. ADDITIONAL REVTeX DATA FIELDS: **r**: `revdata,eprint,url,url-blk,translation`—Include REVTeX data fields collaboration, eid, eprint, archive, url, translation

69. SLACcitation FIELD: **?**: `SLACcitation`—Produce SLACcitation field

70. NUMPAGES DATA FIELD: *****: `numpages-x`—Do not include numpages field

71. REFERENCE COMPONENT TAGS: **b**: `bibinfo`—Reference component tags like `\bibinfo` in the content of `\bibitem`

72. ELEMENT TAGS: **b**: `bibfield`—Element tags like `\bibfield` in the content of `\bibitem`

73. COMPATIBILITY WITH PLAIN TEX: *****: `nfss`—Use LaTeX commands which may not work with Plain TeX

A file `apsrmp.dbj` file equivalent to the following should result:

```
%\input docstrip
%\preamble
%----------------------------------------
%*** REVTeX-compatible RMP 2010-02-12 ***
%\endpreamble
%\postamble
%End of customized bst file
%\endpostamble
%\keepsilent
%\askforoverwritefalse
%\def\MBopts{\from{merlin.mbs}{%
%  head,\MBopta}
%\from{physjour.mbs}{\MBopta}
%\from{geojour.mbs}{\MBopta}
%\from{photjour.mbs}{\MBopta}
%\from{merlin.mbs}{tail,\MBopta}}
%\def\MBopta{%
%  ay,%: Author-year with some non-standard interface
%  nat,%: Natbib for use with natbib v5.3 or later
%  lang,%: Use language field to switch hyphenation patterns for title
%  pres,pres-bf,%: Presentation, speaker bold face
%  vonx,%: Sort without von part (de la Maire after Mahone)
%  nm-rev1,%: Only first name reversed, initials (AGU style: Smith, J. F., H. K. Jones)
%  jnrlst,%: Junior comes last as Smith, John, Jr.
%  nmft,nmft-def,%: User defined author font (\bibnamefont)
%  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-par,%: Year in parentheses as (1993)
%  dtrev,%: Date as year month
%  date-nil-x,%: If date is empty, then do not produce the surrounding punctuation (parens, bracke
%  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-endbibitem,%: Command at end instead of period
%  pp,%: `Page' abbreviated as p. or pp.
%  ed,%: `Editor' abbreviated as ed. or eds.
%  abr,%: Abbreviations of such words
%  ednx,%: `Edition' abbreviated as `ed'
%  ord,%: Numerical editions as 1st, 2nd, 3rd, etc
%  jabr,%: Abbreviated journal names
%  and-com,%: Comma even with 2 authors as `Tom, and Harry'
%  etal-it,%: Italic et al
%  revdata,eprint,url,url-blk,translation,%: Include REVTeX data fields collaboration, eid, eprint
%  SLACcitation,%: Produce SLACcitation field
%  numpages-x,%: Do not include numpages field
%  url,url-prefix-x,%: URL without prefix (default: `URL ')
%  bibinfo,%: Reference component tags like \bibinfo in the content of \bibitem
%  bibfield,%: Element tags like \bibfield in the content of \bibitem
%  nfss,%: Use LaTeX commands which may not work with Plain TeX
%,{%
%  }}
%\generate{\file{apsrmp4-2.bst}{\MBopts}}
%\endbatchfile
%
```

For a comparison between apsrmp.bst and apsrev.bst, see Section 31.3.10.

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

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

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

`\@bibdataout@rmp` When the journal is RMP, the meaning of the procedure `\@bibdataout@aps` needs to be different because of the way the author names are formatted. In other respects, it is the same.

```
\def\@bibdataout@aps{%
 \immediate\write\@bibdataout{%
```

An entry that controls processing of the revtex4-2.dtx.bst file has entry type `@CONTROL`. This entry's cite key is `apsrmp41Control`, which serves as a version number.

```
  @CONTROL{%
   apsrmp41Control%
```

Say whether we want long bibliography style (the default), or the abbreviated style.

```
    \longbibliography@sw{%
     ,author="03",editor="0",pages="1",title="0",year="0"%
    }{%
     ,author="0B",editor="0",pages="0",title="0",year="1"% TeXSupport
    }%
   }%
 }%
```

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

```
 \if@filesw
  \immediate\write\@auxout{\string\citation{apsrmp41Control}}%
 \fi
}%
```

`\bibpunct` `\bibsection` `\bibpreamble` `\newblock` `\bibhang` `\bibsep` `\cite` 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 author-year citations: when `\NAT@set@cites` executes (at `\begin{document}` time), the `\@biblabel` will be set to `\NAT@biblabel`.

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).

Incidently, 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,

\textciteshould put the word 'and' between two citations and before the last citation in a list of 3 or more."

```
\appdef\setup@hook{%
```

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

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

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

```
 \def\bibsection{%
  \expandafter\section\expandafter*\expandafter{\refname}%
  \@nobreaktrue
 }%
 \let\bibpreamble\@empty
 \def\newblock{\ }%
 \bibhang10\p@
 \bibsep\z@
```

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

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

End of code to be delayed until after natbib loads.

```
}%
```

\footinbib@sw Footnotes in bibliography are consistent only with numbered citations, and are particularly nasty under natbib: the packcage 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@.

```
\@booleanfalse\footinbib@sw
\appdef\setup@hook{%
 \footinbib@sw{%
  \class@warn{%
   Footnotes in bibliography are incompatible with RMP.^^J%
   Undoing the footinbib option.
  }%
  \@booleanfalse\footinbib@sw
 }{}%
 \@ifnum{\NAT@merge>\@ne}{\let\NAT@merge\@ne}{}%
 \def\NAT@cmprs{\z@}%
}%
```

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

```
\def\eprint#1{eprint #1}%
```

33.5 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.

```
\def\toc@@font{%
 \footnotesize\rmfamily
 \def\\{\space\ignorespaces}%
}%
\def\ltxu@dotsep{5.5pt}%
```

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

```
\def\tocleft@{\z@}%
\def\tocdim@min{5\p@}%
\def\l@section{%
 \l@@sections{}{section}% Implicit #3#4
}%
\def\l@subsection{%
 \l@@sections{section}{subsection}% Implicit #3#4
}%
\def\l@subsubsection{%
 \l@@sections{subsection}{subsubsection}% Implicit #3#4
}%
%\def\l@subsubsection#1#2{}%
\def\l@paragraph#1#2{}%
\def\l@subparagraph#1#2{}%
```

Activate the TOC processing.

```
\let\toc@pre\toc@pre@auto
\let\toc@post\toc@post@auto
```

```
%</rmp>
```

Here ends the programmer's documentation.

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