

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.

Contents

1	Using REVTeX	5
1.1	Bill of Materials	5
1.1.1	Primary Source	5
1.1.2	Generated by <code>tex revtex4-2.dtx</code>	5
1.1.3	Generated by <code>pdflatex revtex4-2.dtx</code>	5
1.1.4	Auxiliary	5
2	Code common to all modules	6
3	The driver module driver	6
3.0.1	Docstrip and info directives	7
3.1	The Frontmatter File	7
3.2	The Document Body	10
4	Overview	10
5	Writing journal-specific extensions to REVTeX	12
6	The <code>revtex4</code> Document Class	13
6.1	Compatibility Processing	13
7	Extensions to the L^AT_EX Kernel	13
7.1	Hooks	14
8	Compatibility with the geometry package	14

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†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

9	Options	15
9.1	Define Booleans Used in Options	15
9.2	Declare Options	15
9.2.1	Checkin: for Editorial Use	15
9.2.2	Preprint Style	16
9.2.3	Showing PACS and keywords	16
9.2.4	Balance the last page when in two-column page grid	16
9.2.5	Showing preprint numbers	17
9.2.6	Hypertext Option	17
9.2.7	Type Size	17
9.2.8	Media Size	17
9.2.9	Bibnotes	18
9.2.10	Footinbib	18
9.2.11	altaffilletter	19
9.2.12	superbib	19
9.2.13	citeautoscript	19
9.2.14	Variants on the Bibliography Style	19
9.2.15	Simplex/Duplex Pages	20
9.2.16	Two-Column Page Grid	20
9.2.17	raggedbottom or flushbottom	22
9.2.18	tightenlines	22
9.2.19	lengthcheck	22
9.2.20	Draft and Final	22
9.2.21	eqsecnum	23
9.2.22	secnumarabic	23
9.2.23	floats/endfloats	23
9.2.24	titlepage/notitlepage	24
9.2.25	Substyle and Sub-substyle	24
9.2.26	Optical Society of America	25
9.2.27	Presenting Authors and Their Affiliations	27
9.2.28	Typeset by REVTeX	27
9.3	Attempt to fix float placement failure	27
9.4	Option to relax page height	28
9.5	Selecting procedure for processing abstract	28
9.6	Option to turn on diagnostics in the frontmatter	28
9.7	Default Option, Society, Journal, and pointsize	29
9.8	Class-Asserted Options	31
10	Procedures Dependent Upon Options	32
11	Required Packages	33
12	Incompatible Packages	34
13	Society- and Journal-Specific Code	34

14 Body	35
14.1 counters	35
14.2 float parameters	36
14.3 List Environments	36
14.4 Sectioning Commands	37
14.4.1 Sectioning Commands and Their Productions	37
14.4.2 The Acknowledgments Environment	38
14.4.3 Part Opener	39
14.4.4 Stacked Heads	39
14.4.5 Runin Heads	40
14.5 Math	40
14.6 Type Size-Dependent Settings	40
14.7 All Point Sizes	40
14.8 Figures	41
14.8.1 Deferring <code>figure</code> Floats	42
14.9 Tables	43
14.9.1 Deferring <code>table</code> Floats	44
14.10 Videos	45
14.10.1 Deferring <code>video</code> Floats	46
15 Tabular	47
16 Footnote Text	47
16.1 Citations, Bibliography, Endnotes	48
16.1.1 Bibliography	48
16.1.2 <code>\endnotes</code> and <code>\rtx@bibnotes</code>	57
17 Initial setup	63
18 <code>\appendix</code>	64
19 Changing the page grid	65
19.1 Avoiding Grid Changes	65
19.2 Galley Style: Margin Changes	65
19.3 Grid Changing Via <code>ltxgrid</code>	65
20 Old font commands	67
21 English-Language Texts	67
22 Legacy Commands	69
23 Corrected Indentation for <code>tableofcontents</code>	71
24 Patches for <code>lineno.sty</code>	72
25 Endgame for the Document Class	73
25.1 Job Macro Package	73
25.2 Endgame Processing for the Document Class	73
26 Symbols: the <code>revsymb</code> module	75

27 The 10pt class option: the 10pt module	79
27.1 Defend Against Forseeable Errors	79
28 The 11pt class option: the 11pt module	82
28.1 Defend Against Forseeable Errors	82
29 The 12pt class option: the 12pt module	83
29.1 Defend Against Forseeable Errors	84
30 Page parameters	85
31 The aps class extension: the aps module	87
31.1 Defend Against Forseeable Errors	87
31.2 Abbreviations	88
31.3 APS Setup	89
31.3.1 Title block	89
31.3.2 Stacked Heads	94
31.3.3 Runin Heads	95
31.3.4 Table of Contents	97
31.3.5 Default column bottom	98
31.3.6 Table alignment style	98
31.3.7 Footnote formatting	98
31.3.8 Appendix	99
31.3.9 Bibliography	99
31.3.10 Comparing apsrev.bst and apsrmp.bst	105
31.3.11 Index	107
31.4 Journal- and Pointsize-Specific Code	107
31.5 Typesize-Specific Code	108
31.5.1 pra	108
31.5.2 prb	108
31.5.3 prc	108
31.5.4 prd	108
31.5.5 pre	109
31.5.6 prl	109
31.5.7 prper	110
31.5.8 prab	110
31.5.9 prx	110
31.5.10 prapplied	111
31.5.11 prmaterials	111
31.5.12 prfluids	111
31.5.13 physrev	111
31.5.14 rmp	111
31.6 Establish APS Defaults	111
31.7 APS Sanity Checking	112
32 The rmp journal substyle: the rmp module	113
32.1 Frontmatter	114

33 :	116
33.1 General Text	116
33.2 Sectioning	116
33.3 Figure and Table Caption Formatting	118
33.4 Citations and Bibliography	118
33.5 Table of Contents	126
Index	135

1 Using REVTeX

The file `README` has retrieval and installation information.
 User documentation is presented separately in `auguide.tex`.
 The file `template.aps` is a boilerplate file.

1.1 Bill of Materials

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

1.1.1 Primary Source

One single file generates all.

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

1.1.2 Generated by `tex revtex4-2.dtx`

Typesetting this 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 L^AT_EX generates the documentation.

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

1.1.4 Auxiliary

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

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

2 Code common to all modules

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

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

```
1 %<*doc|kernel|aps|rmp|revsymb>
2 \NeedsTeXFormat{LaTeX2e}[1996/12/01]%
3 %</doc|kernel|aps|rmp|revsymb>
4 %<kernel>\ProvidesClass{revtex4-2}
5 %<aps>\ProvidesFile{aps4-2}
6 %<rmp>\ProvidesFile{apsrmp4-2}
7 %<10pt>\ProvidesFile{aps10pt4-2}
8 %<11pt>\ProvidesFile{aps11pt4-2}
9 %<12pt>\ProvidesFile{aps12pt4-2}
10 %<revsymb>\ProvidesPackage{revsymb4-2}
11 %<*doc>
12 \ProvidesFile{revtex4-2.dtx}
13 %</doc>
14 %<!*package&!options>
15 %<version>
16 [2022/06/05 4.2f (https://journals.aps.org/revtex/ for documentation)]% \fileversion
17 %</*!package&!options>
```

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

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

3 The driver module driver

This module, consisting of the present section, typesets the programmer’s documentation, generating the `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.

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

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

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

We ask for the usual indices and glossaries.

```
24 \CodelineIndex\EnableCrossrefs % makeindex -s gind.ist revtex4
25 \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.

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

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

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

3.1 The Frontmatter File

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

```
28 \begin{filecontents*}{README-REVTEX.tex}
29 \title{%
30 The \classname{revtex4-2} document class of the American Physical Society%
31 \protect\thanks{Work under hire to American Physical Society. Version \fileversion\ \copyri
32 }%
33 \author{Arthur Ogawa and Mark Doyle%
34 \protect\thanks{First revision of REV\TeX4.0 (unreleased) by David Carlisle, all released v
35 }%
36 \date{Version \fileversion, dated \filedate}%
37 \newcommand\revtex{REV\TeX}
38
39 \maketitle
40
41 This file embodies the implementation of the APS \revtex\ 4.2 document class
42 for electronic submissions to journals.
43
44 The distribution point for this work is
45 \url{https://journals.aps.org/revtex/},
46 which contains fully unpacked, prebuilt runtime files and documentation.
47
48 \tableofcontents
49
50 \section{Using \protect\revtex}
51
52 The file \file{README} has retrieval and installation information.
53
54 User documentation is presented separately in \file{auguide.tex}.
55
56 The file \file{template.aps} is a boilerplate file.
57
58 \changes{4.0a}{1998/01/16}{Initial version}
59 \changes{4.0a}{1998/01/31}{Move after process options, so \cs{clearpage} not in scope of two
60 \changes{4.0a}{1998/01/31}{Rearrange the ordering so numerical ones come first. A0: David, w
61 \changes{4.0a}{1998/01/31}{use font-dependent spacing}
62 \changes{4.0a}{1998/01/31}{4.0d had twoside option setting twoside switch to false}
63 \changes{4.0a}{1998/01/31}{Move after process options, so the following test works}
64 \changes{4.0a}{1998/01/31}{print homepage}
65 \changes{4.0a}{1998/01/31}{protect against hyperref revtex kludges which are not needed now}
66 \changes{4.0a}{1998/06/10}{multiple preprint commands}
67 \changes{4.0a}{1998/06/10}{comma not space between email and homepage}
68 \changes{4.0a}{1998/06/10}{single space footnotes}
69 \changes{4.0b}{1999/06/20}{First modifications by Arthur Ogawa (mailto:arthur\_ogawa at sbcg
```

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

71 \changes{4.0b}{1999/06/20}{Added localization of \cs{tablename}}

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

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

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

75 \changes{4.0b}{1999/06/20}{AO: made aps.rtx part of revtex4.dtx}

76 \changes{4.0b}{1999/06/20}{AO: remove duplicates}

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

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

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

80 \changes{4.0b}{1999/06/20}{Define three separate environments, defer assignment to \cs{AtBeginDocument}}

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

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

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

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

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

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

87 \changes{4.0b}{1999/06/20}{Removed invocation of nonexistent class option \protect\classopti

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

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

90 \changes{4.0c}{1999/11/13}{(AO, 115) If three or more preprints specified, set on single lin

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

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

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

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

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

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

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

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

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

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

101 \changes{4.0c}{1999/11/13}{Prevent an inner footnote from performing twice}

102 \changes{4.0d}{2000/04/10}{Also alter how lists get indented.}

103 \changes{4.0d}{2000/04/10}{eprint takes an optional argument, syntactical only in this case.}

104 \changes{4.0d}{2000/04/10}{New option}

105 \changes{4.0d}{2000/05/10}{More features and bug fixes: compatability with longtable and arr

106 \changes{4.0d}{2000/05/17}{make longtable trigger the head, too}

107 \changes{4.0d}{2000/05/18}{But alternative spelling is deprecated.}

108 \changes{4.0e}{2000/09/20}{New option showkeys}

109 \changes{4.0e}{2000/11/14}{Bug fixes and minor new features: title block affiliations can ha

110 \changes{4.0e}{2000/11/21}{adornments above and below.}

111 \changes{4.0f}{2001/02/13}{Last bug fixes before release.}

112 \changes{4.0rc1}{2001/06/17}{Running headers always as if two-sided}

113 \changes{4.0rc1}{2001/06/18}{grid changes with push and pop}

114 \changes{4.0rc1}{2001/06/18}{grid changes with push and pop}

115 \changes{4.0rc4}{2001/07/23}{hyperref is no longer loaded via class option: use a usepackage

116 \changes{4.1a}{2008/01/18}{(AO, 457) Endnotes to be sorted in with numerical citations.}%

117 \changes{4.1a}{2008/01/18}{(AO, 451) ‘‘Cannot have more than 256 cites in a document’’}%

118 \changes{4.1a}{2008/01/18}{(AO, 457) Endnotes to be sorted in with numerical citations.}%

119 \changes{4.1a}{2008/01/18}{(AO, 460) ‘‘Proper style is "FIG. 1. ..." (no colon)’’}%

120 \changes{4.1a}{2008/01/18}{(AO, 478) \cs{ds@letterpaper}, so that ‘‘letterpaper really is th

121 \changes{4.1a}{2008/01/18}{(AO, 488) Change processing of options to allow an unused option

122 \changes{4.1a}{2008/01/19}{(AO, 461) Change the csname revtex uses from @dotsep to ltxu@dots

123 \changes{4.1a}{2008/01/19}{For natbib versions before 8.21, \cs{NAT@sort} was consulted only

124 \changes{4.1b}{2008/05/29}{The csname `substyle@ext` is now defined without a dot (`.`), to be c

125 \changes{4.1b}{2008/06/01}{(A0) Implement `bibnotes` through `\cs{frontmatter@footnote@produce}`

126 \changes{4.1b}{2008/06/01}{Add option `reprint`, opposite of `preprint`, and preferred alternati

127 \changes{4.1b}{2008/06/29}{(A0, 455) Be nice to a list within the abstract (assign `\cs{@totallef`

128 \changes{4.1b}{2008/06/30}{(A0) Structure the Abstract using the `\texttt{bibliography}` environ

129 \changes{4.1b}{2008/07/01}{(A0) coordinate `\cs{if@twoside}` with `\cs{twoside@sw}`}

130 \changes{4.1b}{2008/07/01}{(A0) make settings at class time instead of deferring them to lat

131 \changes{4.1b}{2008/07/01}{(A0) No longer need to test `\cs{chapter}` as of `\texttt{natbib}` ve

132 \changes{4.1b}{2008/07/01}{(A0) No longer use `\cs{secnumarabic@sw}`, instead use `\cs{setup@se`

133 \changes{4.1b}{2008/07/01}{(A0) Provide more diagnostics when `\cs{@society}` is assigned.}

134 \changes{4.1b}{2008/07/01}{(A0) provide option `longbibliography`}

135 \changes{4.1b}{2008/07/01}{Add `\cs{@hangfroms@section}`}

136 \changes{4.1b}{2008/07/01}{Break out `\cs{@caption@fignum@sep}`}

137 \changes{4.1b}{2008/07/01}{Class option `galley` sets `\cs{preprintsty@sw}` to false}

138 \changes{4.1b}{2008/07/01}{Code relating to new syntax for `frontmatter` has been placed in `\f`

139 \changes{4.1b}{2008/07/01}{Package `textcase` is now simply a required package}

140 \changes{4.1b}{2008/07/01}{Procedures `\cs{@parse@class@options@society}` and `\cs{@parse@class`

141 \changes{4.1b}{2008/07/01}{Read in all required packages together}

142 \changes{4.1b}{2008/07/01}{Remove options `newabstract` and `oldabstract`}

143 \changes{4.1b}{2008/08/01}{Section numbering via procedures `\cs{secnums@rtx}` and `\cs{secnums`

144 \changes{4.1b}{2008/08/04}{As with author formatting, rag the right more, and assign `\cs{@to`

145 \changes{4.1b}{2008/08/04}{Rag the right even more: `.8\cs{hsz}`. Also, assign `\cs{@totallef`

146 \changes{4.1b}{2008/08/04}{The `\texttt{rmp}` journal `substyle` selects `\texttt{groupedaddress}`}

147 \changes{4.1b}{2008/08/04}{Use `\cs{setup@hook}` to initialize all.}

148 \changes{4.1c}{2008/08/15}{Document class option `longbibliography` via `\cs{substyle@post}`}

149 \changes{4.1d}{2009/03/27}{Definition of `\cs{@fnsymbol}` follows `fixltx2e.sty`}

150 \changes{4.1e}{2008/06/29}{(A0, 455) be nice to a list within the abstract}

151 \changes{4.1f}{2009/07/07}{(A0, 513) Add class option `linenumbers`: number the lines a `la \cl`

152 \changes{4.1f}{2009/07/07}{(A0, 516) Merged references are separated with a semicolon}

153 \changes{4.1f}{2009/07/10}{(A0, 520) Automatically produce `\cs{bibliography}` command when ne

154 \changes{4.1f}{2009/07/11}{(A0, 521) Lonely bibliography head}%

155 \changes{4.1f}{2009/07/11}{(A0, 522) Warn if software is expired}%

156 \changes{4.1f}{2009/07/15}{(A0, 523) Add class option `nomerge`, to turn off new `natbib` 8.3 sy

157 \changes{4.1f}{2009/07/20}{(A0, 524) Makes no sense if citations are superscript numbers and

158 \changes{4.1f}{2009/10/05}{(A0, 530) `\cs{@fnsymbol}`: Failed to import `fixltx2e.sty` technolog

159 \changes{4.1g}{2009/10/07}{(A0, 525) Remove phantom paragraph above display math that is giv

160 \changes{4.1g}{2009/10/07}{(A0, 538) `\cs{MakeTextUppercase}` inappropriately expands the doub

161 \changes{4.1h}{2009/10/09}{(A0) Remove expiry code in the release software}%

162 \changes{4.1i}{2009/10/23}{(A0, 541) Defer assignment of `\cs{cite}` until after `natbib` loads}

163 \changes{4.1j}{2009/10/24}{(A0, 549) Repairing `natbib`'s `\cs{BibitemShut}` and `\cs{bibAnnote}`}

164 \changes{4.1j}{2009/10/25}{(A0, 545) hypertext capabilities off by default; enable with `\cla`

165 \changes{4.1j}{2009/10/25}{(A0, 552) Repair spacing in `\cs{onlinecite}`}

166 \changes{4.1k}{2009/11/06}{(A0, 554) give the `\cs{newlabel}` command syntax appropriate to th

167 \changes{4.1n}{2009/11/06}{(A0, 565) restore 4.0 behavior: invoking class option `preprint im`

168 \changes{4.1n}{2009/11/30}{(A0, 566) restore 4.0 behavior: flush column bottoms}

169 \changes{4.1n}{2009/12/05}{(A0, 569) Use of `\classname{hyperref}` interferes with column bala

170 \changes{4.1n}{2009/12/09}{(A0, 569) execute the after-last-shipout procedures from within t

171 \changes{4.1n}{2010/01/02}{(A0, 571) Interface `\cs{set@footnotewidth}` for determining the se

172 \changes{4.1n}{2010/01/02}{(A0, 572) Independent footnote counter for title block. Abstract

173 \changes{4.1n}{2009/12/13}{(A0, 573) arrange to load `\classname{lineno}` after any other pack

174 \changes{4.1n}{2010/01/04}{(A0, 575) the default for journal `prstper` is `longbibliography`}%

175 \changes{4.1n}{2010/01/04}{(A0, 576) In `.bst` files, remove support for the `annote` field}%

176 \changes{4.1n}{2010/01/02}{(A0) fine-tune spacing above and below `widetext`}%

177 \changes{4.1n}{2010/01/02}{(A0, 571) class file must set `\cs{splittopskip}`; fine tune `\cs{sk`

```

178 \changes{4.1n}{2010/01/02}{(A0, 572) \cs{@makefntext} and \cs{frontmatter@makefntext} must b
179 \changes{4.1o}{2010/02/02}{(A0, 575) Automatically incorporate the (Bib\TeX-generated) .bbl
180 \changes{4.1o}{2010/02/05}{(A0, 549) Remove patch to natbib, which is now at version 8.31a}
181 \changes{4.1o}{2010/02/07}{(A0, 578) accommodate the possible space character preceding \cs{
182 \changes{4.1o}{2010/02/05}{(A0, 579) Endnote shall comprise their own Bib\TeX\ entry type: @
183 \changes{4.1o}{2010/02/10}{(A0, 580) Provide a document class option to turn off production
184 \changes{4.1o}{2010/02/12}{(A0, 580) Control .bst at run time.}%
185 \changes{4.1o}{2010/02/09}{(A0, 581) Handle case: merged references, with first ending in a
186 \changes{4.1p}{2010/02/24}{(A0, 583) Provide interface to \classname{ltxgrid} \cs{onecolumn@
187 \changes{4.1p}{2010/02/24}{(A0, 584) Per MD, remove trailing space character from each journa
188 \changes{4.1q}{2010/04/01}{(A0, 586) When .bbl is pasted into the document, prevent automati
189 \changes{4.1q}{2010/04/13}{(A0, 588) Only write \revtex-specific BibTeX .bib data if the .bs
190 \changes{4.1r}{2010/06/22}{(A0, 595) Provide \cs{lovname} along with other List of Videos de
191 \changes{4.2a}{2014/12/31}{(Aptara, MD) Added initial support for SOR and AAPM journals, add
192 \changes{4.2a}{2014/12/31}{(Aptara) Make prb style to follow other Phys. Rev. journals.}%
193 \changes{4.2a}{2014/12/31}{(Aptara) Corrected indentation for tableofcontents appearing along
194 \changes{4.2a}{2017/11/21}{(MD) Make long bibliography style the default now.}%
195 \changes{4.2a}{2017/11/28}{(MD) Add call to normalsize to be a good citizen and allow bookta
196 \changes{4.2b}{2018/12/26}{(MD) Make titles in bibliography default, prb style to follow oth
197 \changes{4.2b}{2017/11/21}{(MD) Update options for new titles without "Special Topics" and m
198 \changes{4.2b}{2017/11/21}{(MD) Add options for new APS journals and a generic physrev optio
199 \changes{4.2b}{2017/11/22}{(MD) Change default to not use a title page - it seems antiquated
200 \changes{4.2b}{2017/11/22}{(MD) MD - not sure why these parameters were different previously
201 \changes{4.2b}{2017/11/22}{(MD) PACS are obsolete altogether now}%
202 \changes{4.2b}{2018/12/26}{(MD) Improve control over display of e-print ids in bibliography.
203
204 \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.

```

205 %\newcommand\revtex{REV\TeX}% TeXSupport
206 \begin{document}%
207 \expandafter\DocInput\expandafter{\jobname.dtx}%
208 \PrintChanges
209 \end{document}

```

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

```

210 %</doc>

```

4 Overview

REVT_{EX} is a L^AT_EX_{2_ε} document class, somewhat like a hybrid of the standard L^AT_EX book and `article` classes.

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

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

REVT _{EX} option	package
<code>amsfonts</code>	<code>amsfonts</code>
<code>amssymb</code>	<code>amssymb</code>
<code>aps</code>	<code>overcite</code>

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

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

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

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

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

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

1. Figure out which society is operative and read in the indicated `.rtx` file.
2. Figure out which journal option is operative and execute the indicated journal command. This may lead to reading in a journal substyle `.rtx` file.
3. Figure out which pointsize is operative and execute the indicated pointsize command. This may lead to reading in a pointsize `.rtx` file.
4. Execute all of the document's options, in the order declared within the document.
5. Read in all required packages (like `natbib`, `amsmath`, `amssymb`), that were determined by class, society, and journal.
6. The last required package, if existing, is the document's style file, the `.rty` file. Note that the `.rty` file can override the assignments of REVTeX, society, journal, and required packages, and even load its own packages. It can also, via appendations to `\setup@hook`, override the setup code itself.
7. Execute all of the setup code accumulated. Such code can be queued by REVTeX itself, by the society, by the journal, or by the pointsize.
8. At this point, REVTeX has completed the process of inputting itself, and L^AT_EX will now execute the `\AtEndOfClass` procedures.

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

1. Install procedures to execute at the very end of the class's `\AtBeginDocument` processing, such as
 - (a) closing out the page grid

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

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

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

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

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

5 Writing journal-specific extensions to REVTeX

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

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

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

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

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

6 The revtex4 Document Class

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

```
211 %<*kernel>
    Print a banner in the log:
212 \GenericInfo{}{\space
213 Copyright (c) 2019 American Physical Society.^J
214 mailto:revtex@aps.org^J
215 Licensed under the LPPL:^^Jhttp://www.ctan.org/tex-archive/macros/latex/base/lppl.txt^^J
216 Arthur Ogawa <arthur_ogawa at sbcglobal dot net>^^J
217 Based on work by David Carlisle <david at dcarlisle.demon.co.uk>^^J
218 Version (4.2d--4.2f): Modified by Mark Doyle and Phelype Oleinik^^J
219 \@gobble
220 }%
```

6.1 Compatibility Processing

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

```
221 \if@compatibility
222   \edef\reserved@a{\errhelp{%
223     Change your \string\documentstyle\space statement to
224     \string\documentclass\space and rerun.
225   }}\reserved@a
226   \errmessage{You cannot run \class@name\space in compatibility mode}%
227   \expandafter\@end
228 \fi
```

7 Extensions to the L^AT_EX Kernel

```
229 %</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.

```
230 %<*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.

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

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

```
232 \appdef\document@inithook{%
233 \switch@longtable
234 \let\LT@makecaption\LT@makecaption@rtx
235 }%
```

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

```
236 \def\LT@makecaption@rtx#1#2#3{%
237 \LT@mcol\LT@cols c{%
238 \hbox to\z@{%
239 \hss
240 \parbox[t]\LTcapwidth{%
241 \sbox\@tempboxa{#1{#2: }#3\unskip\nobreak\vrule\@width\z@\@height\z@\@depth .5\baselinestretch
242 \ifdim\wd\@tempboxa>\hsize
243 #1{#2: }#3\unskip\nobreak\vrule\@width\z@\@height\z@\@depth .5\baselineskip
244 \else
245 \hbox to\hsize{\hfil\box\@tempboxa\hfil}%
246 \fi
247 \endgraf
248 }%
249 \hss
250 }%
251 }%
252 }%
```

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

```
253 \def\protectdef@boldmath{%
254 \expandafter\ifnotrelax\csname boldmath \endcsname}{}%
255 \class@info{Robustifying \string\LaTeX's \string\boldmath\space command}%
256 \expandafter\let\csname boldmath \endcsname\boldmath
257 \expandafter\def\expandafter\boldmath\expandafter{\expandafter\protect\csname boldmath \endcsname}
258 }%
259 }%
260 \appdef\document@inithook{%
261 \protectdef@boldmath
262 }%
```

8 Compatability with the geometry package

The `geometry` package of Hideo Umeki provides a way to specify the metrics of the media and page layout. We want to ensure that REV_TE_X does not foreclose on

the use of this or any other such package, nor to interfere with explicit assignments of such metric parameters within the document preamble.

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

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

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

9 Options

9.1 Define Booleans Used in Options

The following Booleans are used within the document class to allow the document or the substyle to make selections of formatting. An explicit document class option overrides an assignment made by a substyle.

9.2 Declare Options

9.2.1 Checkin: for Editorial Use

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

This option should:

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

```

263 \DeclareOption{checkin}{%
264   \@booleantrue\dateinRH@sw
265   \@booleantrue\preprintsty@sw
266   \def\@pointsize{12}%
267   \@booleantrue\showPACS@sw
268   \@booleantrue\showKEYS@sw
269   \def\fp@proc@h{\allow@breaking@tables}%
270   \def\fp@proc@H{\allow@breaking@tables}%
271 }%
272 \@booleanfalse\dateinRH@sw
273 \def\checkindate{\dateinRH@sw{\tiny(\today)}}{}}%
274 \def\allow@breaking@tables{%
275   \def\array@default{v}% tabular can break over pages
276   \@booleanfalse\floats@sw % table can break over pages
277 }%
```

9.2.2 Preprint Style

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

```
278 \DeclareOption{preprint}{%
279   \@booleantrue\preprintsty@sw
280 \ExecuteOptions{12pt}%
281 }%
282 \DeclareOption{reprint}{%
283   \@booleanfalse\preprintsty@sw
284   \@booleantrue\twocolumn@sw
285 \ExecuteOptions{10pt}%
286 }%
287 \DeclareOption{manuscript}{%
288   \class@warn{Document class option manuscript is obsolete; use preprint instead}%
289 \ExecuteOptions{preprint}%
290 }%
291 \@booleanfalse\preprintsty@sw
```

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

9.2.3 Showing PACS and keywords

```
292 \DeclareOption{showpacs}{%
293   \@booleantrue\showPACS@sw
294 }%
295 \DeclareOption{noshowpacs}{%
296   \@booleanfalse\showPACS@sw
297 }%
298 \DeclareOption{showkeys}{%
299   \@booleantrue\showKEYS@sw
300 }%
301 \DeclareOption{noshowkeys}{%
302   \@booleanfalse\showKEYS@sw
303 }%
304 \@booleanfalse\showPACS@sw
305 \@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.

```
306 \DeclareOption{balancelastpage}{%
307   \@booleantrue\balancelastpage@sw
308 }%
309 \DeclareOption{nobalancelastpage}{%
310   \@booleanfalse\balancelastpage@sw
311 }%
312 \@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`.

```
313 \DeclareOption{nopreprintnumbers}{\@booleanfalse\preprint@sw}%
314 \DeclareOption{preprintnumbers}{\@booleantrue\preprint@sw}%
315 \appdef\setup@hook{%
316 \@ifundefined\preprint@sw{\let\preprint@sw\preprintsty@sw}{}%
317 }%
```

9.2.6 Hypertext Option

```
318 \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.

```
319 \class@warn{Class option "hyperref" is no longer supported.^^JEmploy \string\usepackage{hyp
320 }%
```

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.

```
321 \DeclareOption{10pt}{\def\@pointsize{10}}%
322 \DeclareOption{11pt}{\def\@pointsize{11}}%
323 \DeclareOption{12pt}{\def\@pointsize{12}}%
324 \let\@pointsize\undefined
```

9.2.8 Media Size

```
\paperheight
\paperwidth
```

```

325 \DeclareOption{a4paper}{%
326     \setlength\paperheight {297mm}%
327     \setlength\paperwidth  {210mm}%
328 }%
329 \DeclareOption{a5paper}{%
330     \setlength\paperheight {210mm}%
331     \setlength\paperwidth  {148mm}%
332 }%
333 \DeclareOption{b5paper}{%
334     \setlength\paperheight {250mm}%
335     \setlength\paperwidth  {176mm}%
336 }%
337 \DeclareOption{letterpaper}{%
338     \setlength\paperheight {11in}%
339     \setlength\paperwidth  {8.5in}%
340 }%
341 \DeclareOption{legalpaper}{%
342     \setlength\paperheight {14in}%
343     \setlength\paperwidth  {8.5in}%
344 }%
345 \DeclareOption{executivepaper}{%
346     \setlength\paperheight {10.5in}%
347     \setlength\paperwidth  {7.25in}%
348 }%
349 \DeclareOption{landscape}{%
350     \setlength\@tempdima  {\paperheight}%
351     \setlength\paperheight {\paperwidth}%
352     \setlength\paperwidth {\@tempdima}%
353 }%

```

Effectively select letterpaper.

```

354 \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.

```

355 \DeclareOption{bibnotes}{\let\frontmatter@footnote@produce\frontmatter@footnote@produce@endm
356 \DeclareOption{nobibnotes}{\let\frontmatter@footnote@produce\frontmatter@footnote@produce@f
357 \let\frontmatter@footnote@produce\frontmatter@footnote@produce@footnote
358 \apptdef\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.

```

359 \DeclareOption{footinbib}{\@booleantrue\footinbib@sw}
360 \DeclareOption{nofootinbib}{\@booleanfalse\footinbib@sw}

```

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

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

9.2.11 `altaffilletter`

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

```
362 \DeclareOption{altaffilletter}{\@booleantrue\altaffilletter@sw}%
363 \DeclareOption{altaffilsymbol}{\@booleanfalse\altaffilletter@sw}%
364 \@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.

```
365 \DeclareOption{superbib}{%
366 \let\place@bibnumber\place@bibnumber@sup
367 }%
368 \def\place@bibnumber{\NATx@bibnumfmt}%
```

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

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

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

9.2.13 `citeautoscript`

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

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

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

9.2.14 Variants on the Bibliography Style

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

`\longbibliography@sw` REVTeX's default for `\longbibliography@sw` is `\true@sw`.

```
373 \DeclareOption{longbibliography}{\@booleantrue\longbibliography@sw}%
374 \DeclareOption{nolongbibliography}{\@booleanfalse\longbibliography@sw}%
375 \@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.

```
376 \DeclareOption{eprint}{\@booleantrue\eprint@enable@sw}%
377 \DeclareOption{noeprint}{\@booleanfalse\eprint@enable@sw}%
378 \@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.

```
379 \@booleanfalse\twoside@sw
380 \appdef\document@inithook{%
381 \twoside@sw{\@twosidetrue}{\@twosidefalse}%
382 }%
```

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).

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

9.2.16 Two-Column Page Grid

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

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

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

```
385 \DeclareOption{onecolumn}{\@booleanfalse\twocolumn@sw}%
386 \DeclareOption{twocolumn}{\@booleantrue\twocolumn@sw}%
387 \@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`.

```
388 \def\select@column@grid{%
389 \twocolumn@sw{%
390 \twocolumn@grid@setup
391 \open@twocolumn
392 }{%
```

```
393 \onecolumn@grid@setup
```

```
% \open@onecolumn
```

```
%
```

```
394 }%
```

```
395 }%
```

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

```
397 \select@column@grid
```

```
398 }%
```

`\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`.

```
399 \appdef\setup@hook{%
```

```
400 \let\clearpage@ltx\clearpage
```

```
401 \prepdef\clear@document{\let\clearpage\clearpage@ltx\let\clear@document\@empty\close@column}
```

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

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

```
404 \let\clearpage\clear@document
```

```
405 }%
```

```
406 }%
```

```
407 }%
```

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

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

```
408 \DeclareOption{author-year}{\@booleantrue\authoryear@sw}%
```

```
409 \DeclareOption{numerical}{\@booleanfalse\authoryear@sw}%
```

```
410 \@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`.

```
411 \DeclareOption{galley}{%
```

```
412 \ExecuteOptions{onecolumn}%
```

```
413 \@booleantrue\galley@sw
```

```
414 \@booleanfalse\preprintsty@sw
```

```
415 \appdef\setup@hook{%
```

```
416 \advance\textwidth-\columnsep
```

```
417 \textwidth.5\textwidth
```

```
418 }%
```

```
419 }%
```

```
420 \@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.

```
421 \DeclareOption{raggedbottom}{\@booleantrue\raggedcolumn@sw}
422 \DeclareOption{flushbottom}{\@booleanfalse\raggedcolumn@sw}
423 \@booleanfalse\raggedcolumn@sw
424 \appdef\setup@hook{%
425   \raggedcolumn@sw{raggedbottom}{flushbottom}%
426 }%
```

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.

```
427 \DeclareOption{tightenlines}{\@booleantrue\tightenlines@sw}
428 \@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.

```
429 \@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.

```
430 \DeclareOption{lengthcheck}{%
431   \@booleantrue\lengthcheck@sw
432   \ExecuteOptions{reprint}%
433 }%
```

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

```
434 \appdef\setup@hook{%
435   \lengthcheck@sw{\@booleantrue\tally@box@size@sw}{}%
436 }%
```

9.2.20 Draft and Final

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

```
437 \appdef\setup@hook{%
438   \draft@sw{\overfullrule 5\p@}{\overfullrule\z@}%
439 }%
```

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

```
440 \DeclareOption{draft}{\@booleantrue\draft@sw}%
```

```

441 \DeclareOption{final}{\@booleanfalse\draft@sw}%
442 \@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)”.

```

443 \appdef\setup@hook{%
444 \eqsecnum@sw{%
445 \@addtoreset{equation}{section}%
446 \def\theequation@prefix{\arabic{section}.}%
447 }{}%
448 }%

```

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

```

449 \DeclareOption{eqsecnum}{\@booleantrue\eqsecnum@sw}%
450 \@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.

```

451 \appdef\setup@hook{%
452 \setup@secnums
453 }%
454 \DeclareOption{secnumarabic}{%
455 \def\setup@secnums{\secnums@arabic}%
456 }%
457 \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`.

```

458 \DeclareOption{fleqn}{%
459 \input{fleqn.clo}%
460 }%

```

9.2.23 floats/endfloats

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

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

The Boolean `\floatp@sw` signifies that endfloats are to be set one per page; if false, that endfloats are to be set with multiple floats per page permitted. By

default, the latter. Note that the state of this Boolean is to be changed by the document class in response to user-selected options. The default is established here.

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

```
461 \DeclareOption{floats}{\@booleantrue\floats@sw\@booleanfalse\floatp@sw}
462 \DeclareOption{endfloats}{\@booleanfalse\floats@sw\@booleanfalse\floatp@sw}
463 \DeclareOption{endfloats*}{\@booleanfalse\floats@sw\@booleantrue\floatp@sw}
464 \@booleantrue\floats@sw
465 \@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.

```
466 \DeclareOption{titlepage}{\@booleantrue\titlepage@sw}
467 \DeclareOption{notitlepage}{\@booleanfalse\titlepage@sw}
468 \@booleanfalse\titlepage@sw
```

9.2.25 Substyle and Sub-substyle

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

```
469 \def\change@society#1{%
470 \def\@tempa{#1}%
471 \@ifxundefined\@society{%
472 \class@info{Selecting society \@tempa}%
473 \let\@society\@tempa
474 }{%
475 \@ifx{\@tempa\@society}{-}{%
476 \class@warn{Conflicting society \@tempa<>\@society; not selected}%
477 }%
478 }%
479 }%
480 \def\change@journal#1{%
481 \def\@tempa{#1}%
482 \@ifxundefined\@journal{%
483 \class@info{Selecting journal \@tempa}%
484 \let\@journal\@tempa
485 }{%
486 \@ifx{\@tempa\@journal}{-}{%
487 \class@warn{Conflicting journal \@tempa<>\@journal; not selected}%
488 }%
489 }%
490 }%
```

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.

```
491 \DeclareOption{osa}{\change@society{osa}\let\@journal\@undefined}%
492 \DeclareOption{osameet}{\change@society{osa}\def\@journal{osameet}}%
493 \DeclareOption{opex}{\change@society{osa}\def\@journal{opex}}%
494 \DeclareOption{tops}{\change@society{osa}\def\@journal{tops}}%
495 \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.

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

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

```
497 \appdef\rtx@require@packages{%
498   \RequirePackage[overload]{textcase}%
499 }%
```

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.

```
500 \DeclareOption{amsfonts}{%
501   \def\class@amsfonts{\RequirePackage{amsfonts}}%
502 }%
503 \DeclareOption{noamsfonts}{%
504   \let\class@amsfonts\@empty
505 }%
506 \appdef\rtx@require@packages{%
507   \@ifxundefined\class@amsfonts{\class@amsfonts}%
508 }%
```

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

```
509 \DeclareOption{amssymb}{%
510   \def\class@amssymb{\RequirePackage{amssymb}}%
511 }%
512 \DeclareOption{noamssymb}{%
```

```

513 \let\class@amssymb\@empty
514 }%
515 \appdef\rtx@require@packages{%
516 \@ifundefined\class@amssymb{}\class@amssymb}%
517 }%

```

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

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

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

```

518 \DeclareOption{amsmath}{%
519 \def\class@amsmath{\RequirePackage{amsmath}[\ver@amsmath@prefer]}%
520 }%
521 \DeclareOption{noamsmath}{%
522 \let\class@amsmath\@empty
523 }%
524 \appdef\rtx@require@packages{%
525 \preserve@LaTeX
526 \@ifundefined\class@amsmath{}\class@amsmath}%
527 \appdef\class@enddocumenthook{\test@amsmath@ver}%
528 }%
529 \appdef\preserve@LaTeX{%
530 \let\@ifl@aded@LaTeX\@ifl@aded
531 \let\@ifpackageloaded@LaTeX\@ifpackageloaded
532 \let\@pkgextension@LaTeX\@pkgextension
533 \let\@ifpackagelater@LaTeX\@ifpackagelater
534 \let\@ifl@ter@LaTeX\@ifl@ter
535 \let\@ifl@t@r@LaTeX\@ifl@t@r
536 \let\@parse@version@LaTeX\@parse@version
537 }%
538 \appdef\restore@LaTeX{%
539 \let\@ifl@aded\@ifl@aded@LaTeX
540 \let\@ifpackageloaded\@ifpackageloaded@LaTeX
541 \let\@pkgextension\@pkgextension@LaTeX
542 \let\@ifpackagelater\@ifpackagelater@LaTeX
543 \let\@ifl@ter\@ifl@ter@LaTeX
544 \let\@ifl@t@r\@ifl@t@r@LaTeX
545 \let\@parse@version\@parse@version@LaTeX
546 }%
547 \def\test@amsmath@ver{%
548 \begingroup
549 \restore@LaTeX
550 \@ifpackageloaded{amsmath}{%
551 \@ifpackagelater{amsmath}[\ver@amsmath@prefer]}{%
552 \class@warn{%
553 You have loaded amsmath, version "\csname ver@amsmath.sty\endcsname",\MessageBreak
554 but this class requires version "\ver@amsmath@prefer", or later.\MessageBreak

```

```

555     Please update your LaTeX installation.
556   }%
557 }%
558 }-%
559 }%
560 \endgroup
561 }%
562 \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.

```

563 \DeclareOption{byrevtex}{\@booleantrue\byrevtex@sw}%
564 \@booleanfalse\byrevtex@sw

```

9.3 Attempt to fix float placement failure

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

```

565 \DeclareOption{floatfix}{\@booleantrue\force@deferlist@sw}%
566 \DeclareOption{nofloatfix}{\@booleanfalse\force@deferlist@sw}%
567 \@booleanfalse\force@deferlist@sw

```

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

```

568 \gdef\@fltovf{%
569   \@latex@error{%
570     Too many unprocessed floats%
571     \force@deferlist@sw}{; try class option [floatfix]}%
572   }\@ehb
573 }%
574 \def\@fltstk{%
575   \@latex@warning{%
576     A float is stuck (cannot be placed)%
577     \force@deferlist@sw}{; try class option [floatfix]}%
578   }%
579 }%

```

`\ltxgrid@info@sw` The two options `ltxgridinfo` and `outputdebug` turn on informative diagnostics `\outputdebug@sw` 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.

```
580 \DeclareOption{ltxgridinfo}{%
581   \@booleantrue\ltxgrid@info@sw
582   \@booleantrue\ltxgrid@foot@info@sw
583 }%
584 \DeclareOption{outputdebug}{%
585   \@booleantrue\outputdebug@sw
586   \@booleantrue\ltxgrid@info@sw
587   \@booleantrue\ltxgrid@foot@info@sw
588   \traceoutput
589 }%
```

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.

```
590 \DeclareOption{raggedfooter}{\@booleanfalse\textheight@sw}%
591 \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`.

```
592 \DeclareOption{frontmatterverbose}{\@booleantrue\frontmatterverbose@sw}%
593 \@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.

```
594 \DeclareOption{linenumbers}{%
595   \appdef
596   \class@documenthook{%
597     \RequirePackage{lineno}[2005/11/02 v4.41]%
598     \linenumbersep4pt\relax
599     \linenumbers\relax
600   }%
601 }%
```

By default, line numbering is off.

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

```
602 \DeclareOption{nomerge}{%
603 \appdef\setuphook{%
604 \ifnum{\NAT@merge>\z@}{\let\NAT@merge\z@}{}%
605 }%
606 }%
```

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

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

```
607 \def\@parse@class@options@society{%
608 \edef\@tempa{\@optionlist{\@currname.\@current}}%
609 \expandafter\@for\expandafter\CurrentOption\expandafter:\expandafter=\@tempa\do{%
610 \expandafter\ifnotrelax\csname ds@\CurrentOption\endcsname}{%
611 \IfFileExists{\CurrentOption\substyle@post.\substyle@ext}{%
612 \expandafter\change@society\expandafter{\CurrentOption}%
613 \expandafter\let\csname ds@\CurrentOption\endcsname\empty
614 }{}%
615 }%
616 }%
617 }%
618 \def\@parse@class@options@#1{%
619 \edef\@tempa{\@optionlist{\@currname.\@current}}%
620 \expandafter\@for\expandafter\CurrentOption\expandafter:\expandafter=\@tempa\do{%
621 \expandafter\ifnotrelax\csname ds@\CurrentOption\endcsname{%
622 \begingroup\csname ds@\CurrentOption\endcsname
623 \@ifxundefined#1{%
624 \endgroup
625 }{%
626 \expandafter\endgroup\expandafter\def\expandafter#1\expandafter{#1}%
627 }%
628 }{}%
629 }%
630 }%
631 \def\@parse@class@options@journal{%
632 \edef\@tempa{\@optionlist{\@currname.\@current}}%
633 \expandafter\@for\expandafter\CurrentOption\expandafter:\expandafter=\@tempa\do{%
634 \expandafter\ifnotrelax\csname ds@\CurrentOption\endcsname{%
635 \begingroup
636 \csname ds@\CurrentOption\endcsname
```

```

637 \ifxundefined\@journal{%
638 \endgroup
639 }{%
640 \expandafter\endgroup\expandafter\def\expandafter\@journal\expandafter{\@journal}%
641 }%
642 }{}%
643 }%
644 }%
645 \def\@parse@class@options{%
646 \edef\@tempa{\@optionlist{\@currname.\@current}}%
647 \expandafter\@for\expandafter\CurrentOption\expandafter:\expandafter=\@tempa\do{%
648 \expandafter\ifnotrelax\csname ds@\CurrentOption\endcsname{%
649 \begingroup
650 \csname ds@\CurrentOption\endcsname
651 \ifxundefined\@pointsize{%
652 \endgroup
653 }{%
654 \expandafter\endgroup\expandafter\def\expandafter\@pointsize\expandafter{\@pointsize}%
655 }%
656 }{}%
657 \IfFileExists{\CurrentOption\substyle@post.\substyle@ext}{%
658 \expandafter\change@society\expandafter{\CurrentOption}%
659 \expandafter\let\csname ds@\CurrentOption\endcsname\@empty
660 }{}%
661 }%
662 }%
663 }%

```

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.

```

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

```

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

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

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

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

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

```

666 %</options>
667 %<*package>

```

```

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

```

```

668 \def\substyle@post{4-2}%
669 \def\substyle@ext{rtx}%
670 \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.

```

671 \def\@process@society#1{%
672 \@ifxundefined\@society{%
673 \class@warn{No Society specified, using default society #1}%
674 \def\@society{#1}\let\@journal\@undefined
675 }{}%
676 \expandafter\input\expandafter{\@society\substyle@post.\substyle@ext}%
677 }%

```

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

```

678 \def\@process@journal#1{%
679 \@ifxundefined\@journal{%
680 \class@warn{No journal specified, using default #1}%
681 \def\@journal{#1}%
682 }{}%
683 \expandafter\expandafter
684 \expandafter\rtx@do@substyle
685 \expandafter\expandafter
686 \expandafter{\expandafter\@society\@journal}%
687 }%
688 \def\rtx@do@substyle#1{%
689 \InputIfFileExists{#1\substyle@post.\substyle@ext}{\csname rtx@#1\endcsname}%
690 }%

```

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.

```

691 \def\@process@pointsize#1{%
692 \@ifxundefined\@pointsize{%
693 \def\@pointsize{#1}%
694 \class@warn{No type size specified, using default \@pointsize}%
695 }{}%
696 \expandafter\expandafter
697 \expandafter\rtx@do@substyle
698 \expandafter\expandafter
699 \expandafter{\expandafter\@society\@pointsize pt}%
700 }%

```

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 701 \def\ps@headings{%
702     \let\@oddfoot\@empty\let\@evenfoot\@empty
703     \def\@evenhead{\thepage\hfil\slshape\leftmark}%
704     \def\@oddhead{\slshape\rightmark}\hfil\thepage}%
705     \let\@mkboth\markboth
706     \def\sectionmark##1{%
707         \markboth {\MakeUppercase{%
708             \ifnum \c@secnumdepth >\z@
709                 \thesection\quad
710             \fi
711             ##1}}{}}%
712     \def\subsectionmark##1{%
713         \markright {%
714             \ifnum \c@secnumdepth >\@ne
715                 \thesubsection\quad
716             \fi
717             ##1}}}%
718 \def\ps@myheadings{%
719     \let\@oddfoot\@empty\let\@evenfoot\@empty
720     \def\@evenhead{\thepage\hfil\slshape\leftmark}%
721     \def\@oddhead{\slshape\rightmark}\hfil\thepage}%
722     \let\@mkboth\@gobbletwo
723     \let\sectionmark\@gobble
724     \let\subsectionmark\@gobble
725     }%

\ps@article
\ps@article@final 726 \def\ps@article{%
\ps@preprint 727     \def\@evenhead{\let\\\heading@cr\thepage\quad\checkindate\hfil{\leftmark}}%
728     \def\@oddhead{\let\\\heading@cr{\rightmark}\hfil\checkindate\quad\thepage}%
729     \def\@oddfoot{}%
730     \def\@evenfoot{}%
731     \let\@mkboth\markboth
732     \let\sectionmark\@gobble
733     \let\subsectionmark\@gobble
734     }%
735 \def\ps@article@final{%
736     \def\@evenhead{\let\\\heading@cr\thepage\quad\checkindate\hfil{\leftmark}}%
737     \def\@oddhead{\let\\\heading@cr{\rightmark}\hfil\checkindate\quad\thepage}%
738     \def\@oddfoot{}%
739     \def\@evenfoot{}%
740     \let\@mkboth\markboth
741     \def\sectionmark##1{%
742         \markboth{%
743             \MakeTextUppercase{%
744                 \@ifnum{\c@secnumdepth >\z@}{\thesection\hskip 1em\relax}}{}}%
745         ##1%
746     }%

```



```

747     }{}%
748   }%
749   \def\subsectionmark##1{%
750     \markright {%
751       \@ifnum{\c@secnumdepth >\@ne}{\thesubsection\hskip 1em\relax}{}%
752       ##1%
753     }%
754   }%
755 }%

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

757 \def\ps@preprint{%
758   \def\@oddfont{\hfil\thepage\quad\checkindate\hfil}%
759   \def\@evenfont{\hfil\thepage\quad\checkindate\hfil}%
760   \def\@oddhead{}%
761   \def\@evenhead{}%
762   \let\@mkboth\@gobbletwo
763   \let\sectionmark\@gobble
764   \let\subsectionmark\@gobble
765 }%

766 \let\@oddhead\@empty
767 \let\@evenhead\@empty
768 \let\@oddfont\@empty
769 \let\@evenfont\@empty

```

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

```

770 \def\lastpage@putlabel{%
771   \if@filesw
772     \begingroup
773     \advance\c@page\m@ne
774     \immediate\write\@auxout{\string\newlabel{LastPage}{\thepage}{\thepage}{\thepage}}%
775   \endgroup
776   \fi
777 }%

```

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

```

778 \appdef\clear@document{%
779   \do@output@cc1v{%
780     \lastpage@putlabel
781     \tally@box@size@sw{\total@text}{}%
782   }%
783 }%
784 \providecommand\write@column@totals{}%

```

11 Required Packages

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

```

785 \appdef\rtx@require@packages{%
786 \RequirePackage{url}%
787 }%

```

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`.

```

788 \appdef\document@inithook{%
789 \incompatible@package{cite}%
790 \incompatible@package{mcite}%
791 \incompatible@package{multicol}%
792 }%

```

13 Society- and Journal-Specific Code

`\@journal` Journal test helper, used as

```

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

```

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

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

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

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

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

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

14 Body

14.1 counters

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

```

793 \def\labelenumi{\theenumi.}
794 \def\theenumi{\arabic{enumi}}

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

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

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

804 \def\labelitemi{\textbullet}
805 \def\labelitemii{\normalfont\bfseries\textendash}
806 \def\labelitemiii{\textasteriskcentered}

```

```
807 \def\labelitemiv{\textperiodcentered}
808 \pagenumbering{arabic}
```

14.2 float parameters

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

```
809 \setcounter{topnumber}{2}
810 \def\topfraction{.9}
811 \setcounter{bottomnumber}{1}
812 \def\bottomfraction{.9}
813 \setcounter{totalnumber}{3}
814 \def\textfraction{.1}
815 \def\floatpagefraction{.9}
816 \setcounter{dbltopnumber}{2}
817 \def\dbltopfraction{.9}
818 \def\dblfloatpagefraction{.9}
```

14.3 List Environments

```
819 \newenvironment{verse}{%
820   \let\=\@centercr
821   \list{}{%
822     \itemsep\z@ \itemindent -1.5em\listparindent \itemindent
823     \rightmargin\leftmargin\advance\leftmargin 1.5em}\item[]%
824 }{%
825 \endlist
826 }%

827 \newenvironment{quotation}{%
828   \list{}{%
829     \listparindent 1.5em
830     \itemindent\listparindent
831     \rightmargin\leftmargin \parsep \z@ \@plus\p}\item[]%
832 }{%
833 \endlist
834 }%

835 \newenvironment{quote}{%
836   \list{}{%
837     \rightmargin\leftmargin}\item[]%
838 }{%
839 \endlist
840 }%

841 \def\descriptionlabel#1{%
842   \hspace\labelsep \normalfont\bfseries #1\unskip:%
843 }%

844 \newenvironment{description}{%
845   \list{}{%
846     \labelwidth\z@ \itemindent-\leftmargin
847     \let\makelabel\descriptionlabel
```

```

848 }%
849 }{%
850 \endlist
851 }%

```

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.

```

852 \newcounter{part}%
853 \let\thepart\@undefined
854 \newcounter{section}%
855 \let\thesection\@undefined
856 \newcounter{subsection}[section]%
857 \let\thesubsection\@undefined
858 \newcounter{subsubsection}[subsection]%
859 \let\thesubsubsection\@undefined
860 \newcounter{paragraph}[subsubsection]%
861 \let\theparagraph\@undefined
862 \newcounter{subparagraph}[paragraph]%
863 \let\thesubparagraph\@undefined

```

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

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

```

\secnums@arabic
864 \def\secnums@rtx{%
865   \@ifundefined\thepart{%
866     \def\thepart{\Roman{part}}%
867   }{%
868     \@ifundefined\thesection{%
869       \def\thesection    {\Roman{section}}%
870       \def\p@section     {}%
871     }{%
872       \@ifundefined\thesubsection{%
873         \def\thesubsection  {\Alph{subsection}}%
874         \def\p@subsection  {\thesection\,%
875       }{%
876         \@ifundefined\thesubsubsection{%
877           \def\thesubsubsection {\arabic{subsubsection}}%
878           \def\p@subsubsection {\thesection\,\thesubsection\,%
879         }{%
880           \@ifundefined\theparagraph{%
881             \def\theparagraph  {\alph{paragraph}}%
882             \def\p@paragraph  {\thesection\,\thesubsection\,\thesubsubsection\,%
883           }{%
884             \@ifundefined\thesubparagraph{%
885               \def\thesubparagraph {\arabic{subparagraph}}%
886               \def\p@subparagraph {\thesection\,\thesubsection\,\thesubsubsection\,\theparagraph\,%
887             }{%
888           }%
889 \def\secnums@arabic{%

```

```

890 \@ifxundefined\thepart{%
891   \def\thepart      {\Roman{part}}}%
892 }{}%
893 \@ifxundefined\thesection{%
894   \def\thesection   {\Roman{section}}}%
895   \def\p@section    {}%
896 }{}%
897 \@ifxundefined\thesubsection{%
898   \def\thesubsection {\thesection.\arabic{subsection}}}%
899   \def\p@subsection {}%
900 }{}%
901 \@ifxundefined\thesubsubsection{%
902   \def\thesubsubsection {\thesubsection.\arabic{subsubsection}}}%
903   \def\p@subsubsection {}%
904 }{}%
905 \@ifxundefined\theparagraph{%
906   \def\theparagraph {\thesubsubsection.\arabic{paragraph}}}%
907   \def\p@paragraph  {}%
908 }{}%
909 \@ifxundefined\thesubparagraph{%
910   \def\thesubparagraph {\theparagraph.\arabic{subparagraph}}}%
911   \def\p@subparagraph {}%
912 }{}%
913 }%

```

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`.

```

914 \newenvironment{acknowledgments}{-%
915   \acknowledgments@sw{%
916     \expandafter\section\expandafter*\expandafter{\acknowledgmentsname}%
917   }{}%
918   \par
919   \phantomsection
920   \addcontentsline{toc}{section}{\protect\numberline{}\acknowledgmentsname}%
921 }%
922 }{}%
923 \par
924 }%
925 \@booleantrue\acknowledgments@sw
926 \newenvironment{acknowledgements}{-%
927   \replace@environment{acknowledgements}{acknowledgments}%
928 }{}%
929 \endacknowledgments
930 }%

```

14.4.3 Part Opener

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

```
931 \def\part{\par
932   \addvspace{4ex}%
933   \@afterindentfalse
934   \secdef\@part\@spart}%

935 \def\@part[#1]#2{%
936   \@ifnum{\c@secnumdepth >\m@ne}{%
937     \refstepcounter{part}%
938     \addcontentsline{toc}{part}{\thepart\hspace{1em}#1}%
939   }{%
940     \addcontentsline{toc}{part}{#1}%
941   }%
942   \begingroup
943     \parindent \z@ \raggedright
944     \interlinepenalty\@M
945     \@ifnum{\c@secnumdepth >\m@ne}{%
946       \Large \bf \partname~\thepart%
947       \par\nobreak
948     }{}%
949     \huge \bf
950     #2%
951     \markboth{}{}\par
952   \endgroup
953   \nobreak
954   \vskip 3ex
955   \@afterheading
956 }%

957 \def\@spart#1{{\parindent \z@ \raggedright
958   \interlinepenalty\@M
959   \huge \bf
960   #1\par}
961   \nobreak
962   \vskip 3ex
963   \@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., `\@changefrom@section` or `\@subsectioncntformat`.

```
964 \def\section{%
965   \@startsection
966   {section}%
967   {1}%
968   {\z@}%
969   {0.8cm \@plus1ex \@minus .2ex}%
970   {0.5cm}%
971   {\normalfont\small\bfseries}%
972 }%
```

```

973 \def\subsection{%
974   \@startsection
975     {subsection}%
976     {2}%
977     {\z@}%
978     {.8cm \@plus1ex \@minus .2ex}%
979     {.5cm}%
980     {\normalfont\small\bfseries}%
981 }%

982 \def\subsubsection{%
983   \@startsection
984     {subsubsection}%
985     {3}%
986     {\z@}%
987     {.8cm \@plus1ex \@minus .2ex}%
988     {.5cm}%
989     {\normalfont\small\itshape}%
990 }%

```

14.4.5 Runin Heads

```

991 \def\paragraph{%
992   \@startsection
993     {paragraph}%
994     {4}%
995     {\parindent}%
996     {\z@}%
997     {-1em}%
998     {\normalfont\normalsize\itshape}%
999 }%

1000 \def\subparagraph{%
1001   \@startsection
1002     {subparagraph}%
1003     {5}%
1004     {\parindent}%
1005     {3.25ex \@plus1ex \@minus .2ex}%
1006     {-1em}%
1007     {\normalfont\normalsize\bfseries}%
1008 }%

```

14.5 Math

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

```

1009 \def\theequation{%
1010   \theequation@prefix\arabic{equation}%
1011 }%
1012 \def\theequation@prefix{%

```

14.6 Type Size-Dependent Settings

14.7 All Point Sizes

```

1013 \setcounter{secnumdepth}{4}

```



```

1014 \lineskip 1pt
1015 \normallineskip 1pt
1016 \def\baselinestretch{1}%

1017 \@lowpenalty 51
1018 \@medpenalty 151
1019 \@highpenalty 301

1020 \@beginparpenalty -\@lowpenalty
1021 \@endparpenalty -\@lowpenalty
1022 \@itempenalty -\@lowpenalty

1023 \arraycolsep 3pt
1024 \tabcolsep 2pt
1025 \arrayrulewidth .4pt
1026 \doublerulesep 2pt

1027 \skip\@mpfootins = 0pt

1028 \fboxsep = 3.0pt
1029 \fboxrule = 0.4pt

```

14.8 Figures

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

```

1030 \newenvironment{figure}
1031         {\@float{figure}}
1032         {\end@float}
1033 \newenvironment{figure*}
1034         {\@dblfloat{figure}}
1035         {\end@dblfloat}

1036 \def\listoffigures{\print@toc{lof}}%
1037 \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.

```

1038 \newlength\abovecaptionskip
1039 \newlength\belowcaptionskip
1040 \setlength\abovecaptionskip{10\p@}
1041 \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).

1042 \long\def\@makecaption#1#2{%
1043   \par
1044   % \nobreak
1045   \vskip\abovecaptionskip
1046   \begingroup
1047   \small\rmfamily
1048   \sbox\@tempboxa{%
1049     \let\\\heading@cr
1050     \@make@capt@title{#1}{#2}%
1051   }%
1052   \@ifdim{\wd\@tempboxa >\hsize}{%
1053     \begingroup
1054     \samepage

```

```

1055     \flushing
1056     \let\footnote\@footnotemark@gobble
1057     \@make@capt@title{#1}{#2}\par
1058     \endgroup
1059   }{%
1060     \global \@minipagefalse
1061     \hb@xt@\hsize{\hfil\unhbox\@tempboxa\hfil}%
1062   }%
1063 \endgroup
1064 \vskip\belowcaptionskip
1065 }%
1066 \def\@make@capt@title#1#2{%
1067   \@ifx@empty\float@link{\@firstofone}{\expandafter\href\expandafter{\float@link}}%
1068   {#1}\@caption@fignum@sep#2%
1069 }%
1070 \def\@footnotemark@gobble{%
1071   \@footnotemark
1072   \@ifnextchar[{\@gobble@opt@i}{\@gobble}%
1073 }%
1074 \def\@gobble@opt@i[#1]#2{%
1075 \def\@mpmakefnmark#1{%
1076   \flushing
1077   \parindent=1em
1078   \noindent
1079   \hb@xt@1em{\hss\@makefnmark}%
1080   #1%
1081 }%
1082 \def\@caption@fignum@sep{. }%
1083 \def\setfloatlink{\def\float@link}%
1084 \let\float@link\@empty

```

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

```

1085 \newcounter{figure}
1086 \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`.

```

1087 \def\fps@figure{tbp}
1088 \def\ftype@figure{1}
1089 \def\ext@figure{lof}
1090 \def\fnm@figure{\figurename~\thefigure}

```

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

```

1091 \expandafter\newbox\c@name fbox@\ftype@figure\endcsname
1092 \expandafter\setbox\c@name 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.

```

1093 \appdef\class@documenthook{%
1094   \do@if@floats{figure}{.fgx}%

```

```

1095 }%
1096 \appdef\class@enddocumenthook{%
1097 \printfigures\relax
1098 }%

```

`\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.

```

1099 \newcommand\printfigures{%
1100 \@ifstar{\true@sw}{\floatp@sw{\true@sw}{\false@sw}}%
1101 {%
1102 \print@float{figure}{\oneapage}%
1103 }{%
1104 \print@float{figure}{}%
1105 }%
1106 }%

```

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

```

1107 \appdef\@xfloat@prep{%
1108 \appdef\@parboxrestore{\centering}%
1109 %\let\@makefnmark\@makefnmark@latex
1110 }%

```

14.9 Tables

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

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

```

1111 \newenvironment{table}
1112         {\@float{table}}
1113         {\end@float}
1114 \newenvironment{table*}
1115         {\@dblfloat{table}}
1116         {\end@dblfloat}

```

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

```

1117 \newcounter{table}
1118 \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`.

```

1119 \def\fps@table{tbp}
1120 \def\ftype@table{2}
1121 \def\ext@table{lot}
1122 \def\fnm@table{\tablename~\thetable}

```

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

```
1123 \expandafter\newbox\csname fbox@\ftype@table\endcsname
1124 \expandafter\setbox\csname fbox@\ftype@table\endcsname\hbox{}%

1125 \def\listoftables{\print@toc{lot}}%
1126 \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}...?)

1127 \def\table@hook{\small}%
1128 \def\squeezetable{\def\table@hook{\scriptsize}}%
1129 \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.

```
1130 \def\set@table@environments{%
1131 \floats@sw}{-%
1132 \let@environment{longtable@float}{longtable}%
1133 \let@environment{longtable}{longtable@write}%
1134 \let@environment{longtable*@float}{longtable*}%
1135 \let@environment{longtable*}{longtable*@write}%
1136 \let@environment{turnpage@float}{turnpage}%
1137 \let@environment{turnpage}{turnpage@write}%
1138 }%
1139 \do@if@floats{table}{.tbx}%
1140 }%
1141 \appdef\document@inithook{%
1142 \set@table@environments
1143 }%
1144 \appdef\class@enddocumenthook{%
1145 \printtables\relax
1146 }%
1147 \newenvironment{longtable@write}{-%
1148 \write@@float{longtable}{table}%
1149 }{%
1150 \endwrite@float
1151 }%
1152 \newenvironment{longtable*@write}{-%
1153 \write@@float{longtable*}{table}%
1154 }{%
1155 \endwrite@float
1156 }%
1157 \newenvironment{turnpage@write}{-%
1158 \immediate\write\tablewrite{\string\begin{turnpage}}%
1159 }{%
1160 \immediate\write\tablewrite{\string\end{turnpage}}%
1161 }%
```

`\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.

```

1162 \newcommand\printtables{%
1163 \begingroup
1164 \let@environment{longtable}{longtable@float}%
1165 \let@environment{longtable*}{longtable*@float}%
1166 \let@environment{turnpage}{turnpage@anchored}%
1167 \prepdef\longtable{\trigger@float@par}%
1168 \expandafter\prepdef\csname longtable*\endcsname{\trigger@float@par}%
1169 \expandafter\prepdef\csname table@floats\endcsname{%
1170 \onecolumngrid@push
1171 }%
1172 \expandafter\appdef\csname endtable@floats\endcsname{%
1173 \onecolumngrid@pop
1174 }%
1175 \@ifstar{\true@sw}{\floatp@sw{\true@sw}{\false@sw}}%
1176 {%
1177 \print@float{table}{\oneapage}%
1178 }%
1179 \print@float{table}{}%
1180 }%
1181 \endgroup
1182 }%
1183 \newenvironment{turnpage@anchored}{%
1184 \onecolumngrid@push
1185 \setbox\z@\vbox to\textwidth\bgroup
1186 \columnwidth\textheight
1187 }{%
1188 \vfil
1189 \egroup
1190 \rotatebox{90}{\box\z@}%
1191 \onecolumngrid@pop
1192 }%

```

14.10 Videos

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

```

1193 \newenvironment{video}
1194 {\@float{video}}
1195 {\end@float}%
1196 \newenvironment{video*}
1197 {\@dblfloat{video}}
1198 {\end@dblfloat}%

```

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

```

1199 \newcounter{video}
1200 \renewcommand \thevideo {\@arabic\c@video}

```

File extension and localizable strings.

```

1201 \def\ext@video{lov}%
1202 \def\fname@video{Video}%
1203 \def\lovname{List of Videos}%
      Float type and default placement.
1204 \def\fps@video{tbp}%
1205 \def\ftype@video{4}%
1206 \def\fnm@video{\fname@video~\thevideo}%
1207 \appdef\document@inithook{%
1208   \@ifxundefined\c@float@type{}{%
1209     \global\setcounter{float@type}{8}%
1210   }%
1211 }%

```

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

```

1212 \expandafter\newbox\csname fbox@\ftype@video\endcsname
1213 \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.

```

1214 \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.

```

1215 \def\listofvideos{\print@toc{lov}}%
1216 \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.

```

1217 \appdef\class@documenthook{%
1218   \do@if@floats{video}{.vdx}%
1219 }%
1220 \appdef\class@enddocumenthook{%
1221   \printvideos\relax
1222 }%

```

`\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.

```

1223 \newcommand\printvideos{%
1224   \@ifstar{\true@sw}{\floatp@sw{\true@sw}{\false@sw}}%
1225   {%
1226     \print@float{video}{\oneapage}%
1227   }{%
1228     \print@float{video}{}%
1229   }%
1230 }%

```

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 1231 \def\endtabular@hook{}%
ruledtabular (env.)
%\RequirePackage{dcolumn}%
%

1232 \appdef\document@inithook{%
1233 \ifpackageloaded{dcolumn}{%
1234 \expandafter\ifnotrelax\csname NC@find@d\endcsname{}{}%
1235 \newcolumnntype{d}{D{.}{.}{-1}}%
1236 }%
1237 }{}%
1238 }%
1239 \def\toprule{\hline\hline}%
1240 \def\colrule{\hline}%
1241 \def\botrule{\hline\hline}%
1242 \newenvironment{ruledtabular}{%
1243 \def\array@default{v}%
1244 \appdef\tabular@hook{\def\@halignto{to\hsize}}%
1245 \let\tableleft@skip@default\tableleft@skip
1246 \let\tableleft@skip\tableleft@skip@float
1247 \let\tabmid@skip@default\tabmid@skip
1248 \let\tabmid@skip\tabmid@skip@float
1249 \let\tabright@skip@default\tabright@skip
1250 \let\tabright@skip\tabright@skip@float
1251 \let\array@row@pre@default\array@row@pre
1252 \let\array@row@pre\array@row@pre@float
1253 \let\array@row@pst@default\array@row@pst
1254 \let\array@row@pst\array@row@pst@float
1255 \appdef\array@row@rst{%
1256 \let\array@row@pre\array@row@pre@default
1257 \let\array@row@pst\array@row@pst@default
1258 \let\tableleft@skip\tableleft@skip@default
1259 \let\tabmid@skip\tabmid@skip@default
1260 \let\tabright@skip\tabright@skip@default
1261 \appdef\tabular@hook{\let\@halignto\@empty}%
1262 }%
1263 }{}%
1264 }%
```

16 Footnote Text

```
\@makefnmark We customize the presentation of the footnote mark: it will not be italic.
1265 \def\@makefnmark#1{%
1266 \def\baselinestretch{1}%
1267 \parindent1em%
1268 \noindent
```

```

1269 \hb@xt@1.8em{%
1270 \hss\@makefnmark
1271 }%
1272 #1%
1273 \par
1274 }%
1275 \def\@makefnmark{%
1276 \hbox{%
1277 \@textsuperscript{%
1278 \normalfont\@thefnmark
1279 }%
1280 }%
1281 }%

```

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 REVT_{EX} is finished loading, you can assert any definitions for `natbib` that you wish.

```

\rev@citet We define variants on natbib’s commands \citet, \citealp, and \citealpnun.
\rev@citealp \rev@citealpnun uses a numerical citation. \rev@citealp and \rev@citealpnun
\rev@citealpnun 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@citealpnun` 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.

```

1282 \expandafter\DeclareRobustCommand
1283 \expandafter\rev@citet
1284 \expandafter{%
1285 \expandafter\beginngroup
1286 \expandafter\rtx@swap@citea

```



```

1287 \expandafter\g@bbblefirsttoken
1288         \csname citet \endcsname
1289 }%
1290 \expandafter\DeclareRobustCommand
1291 \expandafter\rev@citealp
1292 \expandafter{%
1293 \expandafter\beginngroup
1294 \expandafter\rtx@swap@citea
1295 \expandafter\g@bbblefirsttoken
1296         \csname citealp \endcsname
1297 }%
1298 \expandafter\DeclareRobustCommand
1299 \expandafter\rev@citealpnum
1300 \expandafter{%
1301 \expandafter\beginngroup
1302 \expandafter\rtx@swap@citenum
1303 \expandafter\g@bbblefirsttoken
1304         \csname citealp \endcsname
1305 }%
1306 \def\rtx@swap@citenum{%
1307 \rtx@swap@citea
1308 \let\@cite\NAT@citenum
1309 \let\NAT@mbox\mbox
1310 \let\citeyear\NAT@citeyear
1311 \let\NAT@space\NAT@spacechar
1312 }%
1313 \def\g@bbblefirsttoken{%
1314 \expandafter\true@sw
1315 \expandafter\@empty
1316 }%

```

`\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.

```

1317 \newcommand\rtx@citesuper[3]{%
1318 \ifNAT@swa
1319 \leavevmode
1320 \unskip
1321 % \hspace{1\p@}%
1322 \textsuperscript{\normalfont#1}%
1323 \if*#3* \else \ (#3)\fi
1324 \else
1325 #1%
1326 \fi
1327 \endgroup
1328 }%

```

`\@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.

```

1329 \def\@makefnmark@cite{\beginngroup\NAT@swatru\@cite{\@thefnmark}}{\}}%

```

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

```

1330 \def\rtx@bibsection{%
1331 \@ifx@empty\refname{%
1332 \par
1333 }{%
1334 % \let\@hangfroms@section\@hang@froms
1335 \expandafter\section\expandafter*\expandafter{\refname}%
1336 \@nobreaktrue
1337 }%
1338 }%

```

`\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`.

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

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

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

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

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

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).

```

1339 \def\rtx@swap@citea{%
1340 \let\NAT@def@citea\rtx@def@citea
1341 \let\NAT@def@citea@close\rtx@def@citea@close
1342 \let\NAT@def@citea@box\rtx@def@citea@box
1343 }%
1344 \def\rtx@def@citea{%
1345 \def\@citea{\NAT@separator\NAT@space}%
1346 \advance\c@NAT@ctr\@ne
1347 \@ifnum{\count@>\tw@}{-%
1348 \@ifnum{\c@NAT@ctr=\count@}{\appdef\@citea{\NAT@conj\NAT@space}}{-%
1349 }-%
1350 \def\@citea{\NAT@space\NAT@conj\NAT@space}%
1351 }%
1352 }%
1353 \def\rtx@def@citea@close{%
1354 \rtx@def@citea
1355 \prepdef\@citea{\NAT@close}%

```

```

1356 }%
1357 \def\rtx@def@citea@box{%
1358 \rtx@def@citea@close
1359 \expandafter\def\expandafter\@citea\expandafter{\expandafter\NAT@mbox\expandafter{\@citea}}%
1360 }%
1361 \def\NAT@conj{and}%

```

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

```

\bibAnnote 1362 \def\NAT@BibitemShut#1{%
1363 \def\@bibstop{#1}%
1364 \let\bibitem@Stop\bibitemStop
1365 \let\bibitem@NoStop\bibitemNoStop
1366 \@ifx{\bibitemShut\relax}{\let\@bibitemShut\@empty}{%
1367 \expandafter\def\expandafter\@bibitemShut\expandafter{\bibitemShut}}%
1368 }%
1369 }%

```

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

```

1370 \def\BibitemShut@ltx#1{%
1371 \unskip
1372 \def\@bibstop{#1}%
1373 \let\bibitem@Stop\bibitemStop
1374 \let\bibitem@NoStop\bibitemNoStop
1375 \@ifx{\bibitemShut\relax}{\let\@bibitemShut\@empty}{%
1376 \expandafter\def\expandafter\@bibitemShut\expandafter{\bibitemShut}}%
1377 }%
1378 }%

```

```

%\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{}%
%

```

```

1379 \newenvironment{thebibliography}{}{}%
1380 \let\@listi\@empty
1381 \appdef\rtx@require@packages{%
1382 \RequirePackage[sort&compress]{natbib}[2009/11/07 8.31a (PWD, AO)]%
1383 \let\environment{NAT@thebibliography}{thebibliography}%
1384 \let\environment{thebibliography}{rtx@thebibliography}%
1385 \let\bibliographystyle@latex\bibliographystyle
1386 \let\NAT@citesuper\rtx@citesuper

```

`\NAT@bibsetnum` We define the sectioning command to use when starting the bibliography and

`\NAT@bibsetup` gently coax `natbib` into using the formatting procedures that *we* want it to use.

`\bibpreamble` This way of setting up `thebibliography` automatically sets the label width

`\newblock` based on the largest number used within the bibliography. This scheme will not

`\bibnumfmt` work properly using the author/year style of bib entry, though.

`\NAT@merge`

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

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

```

1387 \let\bibsection\rtx@bibsection
1388 \let\NATx@bibsetnum\NAT@bibsetnum
1389 \def\NAT@bibsetnum#1{%
1390   \setlength{\topsep}{\z@}%
1391   \NATx@bibsetnum{\ref{LastBibItem}}%
1392 }%
1393 \let\NATx@bibsetup\NAT@bibsetup
1394 \def\NAT@bibsetup{%
1395   \setlength{\labelwidth}{\z@}%
1396   \setlength{\labelsep}{\z@}%
1397   \setlength{\itemindent}{\z@}%
1398   \setlength{\listparindent}{\z@}%
1399   \setlength{\topsep}{\z@}%
1400   \setlength{\parsep}{\z@}%
1401   \NATx@bibsetup
1402 }%
1403 \let\bibpreamble\@empty
1404 \def\newblock{\ }%
1405 \let\NATx@bibnumfmt\bibnumfmt
1406 \def\bibnumfmt{\place@bibnumber}%
1407 \let\NAT@merge\thr@@
1408 \let\NAT@citeyear\citeyear
1409 \let\onlinecite\rev@citealp
1410 \let\textcite\rev@citet

```

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

```

1411 \@ifx{\BibitemShut\NAT@BibitemShut}{%
1412   \class@info{Repairing natbib's \string\BibitemShut}%
1413   \let\BibitemShut\BibitemShut@ltx
1414 }{}%

```

`\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`.

```

1415 \let\bibliographystyle@latex\bibliographystyle
1416 \def\bibliographystyle{\@booleantrue\bibliographystyle@sw\def\@bibstyle}%
1417 \@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.

```

1418 \def\NAT@bibitem@cont{%
1419 \let\bibitem@Stop\bibitemContinue@Stop
1420 \let\bibitem@NoStop\bibitemContinue
1421 }%

1422 \def\bibitemNoStop{%
1423 \@ifx@empty\bibitemShut{.\spacefactor\@mmm\space}{\@bibitemShut}%
1424 }%

1425 \def\bibitemContinue{%
1426 \@ifx@empty\bibitemShut{;\spacefactor\@mmm\space}{\@bibitemShut}%
1427 }%

1428 \def\bibitemContinue@Stop{%
1429 \@ifx@empty\bibitemShut{\spacefactor\@mmm\space}{\@bibitemShut}%
1430 }%
```

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.

```

1431 }%
```

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

```

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

`\onlinecite` We extend `natbib`'s syntax with two commands to set a citation on the baseline `\textcite` (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.

```

1432 \DeclareRobustCommand\onlinecite{\@onlinecite}%
1433 \DeclareRobustCommand\textcite{\@textcite}%
```

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

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

```

1434 \let\bibliography@latex\bibliography
```

```

1435 \def\bibliography#1{%
1436 \auto@bib@empty
1437 \begingroup
1438 \let\auto@bib@innerbib\@empty
1439 \@ifx@empty{\pre@bibdata}{%
1440 \bibliography@latex{#1}%
1441 }{%
1442 \@ifempty{#1}{%
1443 \expandafter\bibliography@latex\expandafter{\pre@bibdata}%
1444 }{%
1445 \expandafter\bibliography@latex\expandafter{\pre@bibdata,#1}%
1446 }%
1447 }%
1448 \endgroup
1449 }%
1450 \let\pre@bibdata\@empty

```

`rtx@thebibliography` (*env.*) We put a tail patch into `\thebibliography` and a headpatch into `\endthebibliography`.

`\present@bibnote` Here we provide a default treatment for frontmatter notes deferred to the bibliography; a journal substyle might want to override the definition of `\present@bibnote`.

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

```

1451 \newenvironment{rtx@thebibliography}[1]{%
1452 \NAT@thebibliography{#1}%
1453 \let\@TBN@opr\present@bibnote
1454 \@FMN@list
1455 }{%

```

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.

```

1456 \auto@bib@innerbib
1457 \edef\@currentlabel{\arabic{NAT@ctr}}%
1458 \label{LastBibItem}%
1459 \endNAT@thebibliography
1460 \aftergroup\auto@bib@empty
1461 }%
1462 \def\present@bibnote#1#2{%
1463 \item[%
1464 \textsuperscript{%
1465 \normalfont
1466 \Hy@raisedlink{\hyper@anchorstart{frontmatter.#1}\hyper@anchorend}}%
1467 \begingroup
1468 \cscname c@\@mpfn@endcsname#1\relax
1469 \frontmatter@thefootnote
1470 \endgroup

```

```
1471 }%
1472 ]#2\par
```

The following line was commented out:

```
%\global\let\NAT@bibitem@first@sw\@secondoftwo
%
1473 }%
```

`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.

```
1474 \def\write@bibliographystyle{%
1475 \ifxundefined\@bibstyle{}{%
1476 \expandafter\bibliographystyle@latex\expandafter{\@bibstyle}%
1477 \bibliographystyle@sw{\@bibdataout@rev}%
1478 }%
1479 \global\let\write@bibliographystyle\relax
1480 }%
1481 \AtEndDocument{\write@bibliographystyle}%
```

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

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

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

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

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

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

true in many distinct cases: the file ends, the next character is a line terminator, the next character is a space.

```

1482 \def\rtx@@citetp[#1]{\@ifnextchar[{\rtx@citex[#1]}{\rtx@citex[][#1]}}%
1483 \def\rtx@citex[#1][#2]#3{%
1484 \begingroup
1485 \def\@tempa{[#1][#2]{#3}}%
1486 \@ifx{\@cite\NAT@citesuper}{%
1487 \leavevmode
1488 \skip@\lastskip
1489 \unskip
1490 \super@cite@let
1491 }{%
1492 \super@cite@end
1493 }%
1494 }%
1495 \def\super@cite@let{%
1496 \futurelet\@let@token\super@cite@check
1497 }%
1498 \def\super@cite@end{%
1499 \aftergroup\@citex\expandafter\endgroup\@tempa
1500 }%
1501 \def\super@cite@check{%
1502 \@ifx{\@let@token\@sptoken}{%
1503 \super@cite@end
1504 }{%
1505 \super@cite@swap
1506 }%
1507 }%
1508 \long\def\super@cite@swap#1{%
1509 \expandafter\@ifx\expandafter{\csname rtx@automove#1\endcsname\@empty}{%
1510 #1%
1511 \super@cite@let
1512 }{%
1513 \super@cite@end
1514 #1%
1515 }%
1516 }%
1517 \expandafter\let\csname rtx@automove.\endcsname\@empty
1518 \expandafter\let\csname rtx@automove,\endcsname\@empty
1519 \expandafter\let\csname rtx@automove:\endcsname\@empty
1520 \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.

```

1521 \appdef\class@documenthook{%
1522 \citeautoscript@sw{%
1523 \@ifx{\@cite\NAT@citesuper}{%
1524 \let\NAT@@citetp\rtx@@citetp
1525 }{%
1526 }{}%

```



```
1527 }%
```

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

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

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

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

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

```
1528 \def\mini@note{\save@note\mini@notes}%Implicit #2  
1529 \def\save@note#1#2{%  
1530   \stepcounter\@mpfn  
1531   \protected@xdef\@thefnmark{\thempfn}%  
1532   \@footnotemark  
1533   \expandafter\g@addto@macro  
1534   \expandafter#1%  
1535   \expandafter{%  
1536   \expandafter \@@footnotetext  
1537   \expandafter {\@thefnmark}{#2}%  
1538   }%  
1539 }%  
1540 \long\def\@@footnotetext#1{\def\@thefnmark{#1}\@footnotetext}%  
1541 \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}%
}%
%
1542 \def\rev@citemark#1{%
1543 \expandafter\cite\expandafter{\@thefnmark}%
1544 }%
1545 \def\rev@endtext#1{%
1546 \let\@endnotelabel\@thefnmark
1547 \@endnotetext
1548 }%

```

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

```

1549 \def\endnote@ext{.end}%
1550 \def\bibdata@app{Notes}%
1551 \def\bibdata@ext{bib}%

```

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

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

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

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

```

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

```

```
%
    \@doendnote is obsolete.

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

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

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

```
1552 \long\def\@endnotetext#1{%
1553   \begingroup
1554     \endnote@relax
1555     \immediate\write\@bibdataout{%
1556       @FOOTNOTE{%
1557         \@endnotelabel,%
```

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

```
1558     key="\@endnotelabel",%
```

The `note` field is simply the content of the footnote.

```
1559     note="#1"%
1560   }%
1561 }%
1562 \endgroup
1563 }%
1564 \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`.

```
1565 \def\endnote@relax{%
1566   \let\label\relax \let\index\relax \let\glossary\relax
1567   \let\cite\relax \let\ref\relax \let\pageref\relax
1568   \let\(\relax \let\) \relax \let\ \relax
1569   \let~\relax
```

```
%\let\protect\noexpand
%
```

```
1570 \let \protect \@unexpandable@protect
1571 \newlinechar'\^M%
```

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

```
1572 \let\begin\relax \let\end\relax
1573 }%
```

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

```
1574 \appdef\class@documenthook{\@bibdataout@init}%
1575 \def\@bibdataout@init{%
1576 \immediate\openout\@bibdataout\pre@bibdata.\bibdata@ext\relax
1577 }%
1578 \def\@bibdataout@rev{%
1579 \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.

```
1580 @CONTROL{%
1581 REVTEX42Control%
```

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

```
1582 \eprint@enable@sw{}{,eprint="1"}%
1583 }%
1584 }%
```

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

```
1585 \if@filesw
1586 \immediate\write\@auxout{\string\citation{REVTEX42Control}}%
1587 \fi
1588 }%
```

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

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

```
1589 \def\printendnotes{%
1590 \class@warn{The \string\printendnotes\space command no longer serves any function. Please r
1591 }%
```

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

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

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

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

```
1592 \def\make@footnote@endnote{%
1593 \footinbib@sw%
1594 \authoryear@sw{}{-%
1595 \ltx@footnote@push
1596 \def\thempfn{Note\thefootnote}%
```

```

1597 \let\ltx@footmark\rev@citemark
1598 \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
%

```

```

1599 }%
1600 }{}%
1601 }%

1602 \def\ltx@footnote@push{%
1603 \let\ltx@footmark@latex\ltx@footmark
1604 \let\ltx@foottext@latex\ltx@foottext
1605 \let\thempfn@latex\thempfn
1606 \def\ltx@footnote@pop{%
1607 \let\ltx@footmark\ltx@footmark@latex
1608 \let\ltx@foottext\ltx@foottext@latex
1609 \let\thempfn\thempfn@latex
1610 }%
1611 }%

```

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`).

```

1612 \appdef\class@documenthook{%
1613 \make@footnote@endnote
1614 }%

```

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

`\auto@bib@innerbib` Note that this facility is not able to work more than once per document. If `\thebibliography@nogroup` multiple bibliographies 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.

```

1615 \def\auto@bib{%
1616 \@ifx@empty\@FMN@list{%
1617 \footinbib@sw{%
1618 \@ifnum{\csname c@\mpfn\endcsname>\z}{%
1619 \true@sw
1620 }{}%
1621 \test@bbl@sw

```

```

1622 }%
1623 }{%
1624 \test@bbl@sw
1625 }%
1626 }{%
1627 \true@sw
1628 }%
1629 {%
1630 \bibliography{}%
1631 }{}%
1632 }%
1633 \def\auto@bib@empty{%
1634 \let\auto@bib@empty
1635 }%

```

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.

```

1636 \def\test@bbl@sw{%
1637 \setbox\z@\vbox\bgroup
1638 \let\providecommand\providecommand@j@nk
1639 \let\bibfield@gobbletwo
1640 \let\bibinfo@gobbletwo
1641 \let\translation@gobble
1642 \let\BibitemOpen@empty
1643 \let\bibitemStop@empty
1644 \let\bibitemNoStop@empty
1645 \let\EOS@empty
1646 \let\BibitemShut@gobble
1647 \let\bibAnnoteFile@gobbletwo
1648 \let\bibAnnote@gobblethree
1649 \let\textbf@gobble
1650 \let\emph@gobble
1651 \@booleanfalse\bibitem@sw
1652 \let\bibitem\bibitem@set
1653 \auto@bib@innerbib
1654 \bibitem@sw{\aftergroup\true@sw}{\aftergroup>false@sw}%
1655 \egroup
1656 }%

```

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

```

1657 \newcommand\bibitem@set[1][{}]{%
1658 \bibitem@sw}{%
1659 \@booleantrue\bibitem@sw
1660 \aftergroup\@booleantrue\aftergroup\bibitem@sw
1661 }%
1662 }%

```

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.

```

1663 \def\auto@bib@innerbib{%
1664 \begingroup
1665 \let@environment{thebibliography}{thebibliography@nogroup}%

```

```

1666 \bibliography{}%
1667 \endgroup
1668 }%

```

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

```

1669 \def\thebibliography@nogroup#1{%
1670 \endgroup
1671 \def\@currenvir{thebibliography}%
1672 }%
1673 \def\endthebibliography@nogroup{\begingroup}%

```

The following should be part of `revtex4-2.dtx`.

```

1674 \long\def \@gobblethree #1#2#3{}%
1675 \def\providecommand@j@nk#1[#2]{%
1676 \@ifnum{#2=\z@}{\def\j@nk}{%
1677 \@ifnum{#2=\@ne}{\def\j@nk##1}{%
1678 \@ifnum{#2=\tw@}{\def\j@nk##1##2}{%
1679 \@ifnum{#2=\thr@@}{\def\j@nk##1##2##3}{%
1680 }%
1681 }%
1682 }%
1683 }%
1684 }%

```

17 Initial setup

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

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

```

1685 \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`.

```

1686 \appdef\setup@hook{%
1687 \tabbingsep \labelsep
1688 \leftmargin\leftmargini
1689 \labelwidth\leftmargin\advance\labelwidth-\labelsep
1690 \let\@listi\@listI
1691 \@listi
1692 }%
1693 % \begin{macrocode}
1694 %
1695 % We ensure that the ‘‘environment’’ component mark (implemented by \file{ltxgrid.dtx})
1696 % is initialized properly (via a hook, itself defined via \file{ltxutil.dtx}).
1697 % \begin{macrocode}
1698 \appdef\class@documenthook{%
1699 \global\c@page\@ne

```

```

1700 \def\curr@envir{document}%
1701 \mark@envir{\curr@envir}%
1702 }%

```

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

It is one of the stranger features of \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 “acceptable to D. E. Knuth”, so it will never be fixed.

```

1703 \def\open@onecolumn{%
1704 \open@column@one\one
1705 \set@colht
1706 \@floatplacement
1707 \@dblfloatplacement
1708 }%
1709 \def\open@twocolumn{%
1710 \open@column@mlt\tw@
1711 \set@colht
1712 \@floatplacement
1713 \@dblfloatplacement
1714 \sloppy
1715 \let\set@listindent\set@listindent@
1716 }%

```

18 \appendix

```

1717 %\newif\ifappendixon

```

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

```

1718 \def\appendix{%
1719 \par
1720 %\appendixontrue
1721 \setcounter{section}\z@
1722 \setcounter{subsection}\z@
1723 \setcounter{subsubsection}\z@
1724 \def\thesubsection{\arabic{subsection}}%
1725 \def\thesubsubsection{\alph{subsubsection}}%
1726 \@addtoreset{equation}{section}%
1727 \def\theequation@prefix{\thesection}%
1728 \addtocontents{toc}{\protect\appendix}%
1729 \@ifstar{%
1730 \def\thesection{\unskip}}%
1731 \def\theequation@prefix{A.}%

```



```

1732 }{%
1733 \def\thesection{\Alph{section}}%
1734 }%
1735 }%

```

19 Changing the page grid

19.1 Avoiding Grid Changes

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

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

```

1736 \def\title@column#1{%
1737 \minipagefootnote@init
1738 #1%
1739 \minipagefootnote@foot
1740 }%
1741 \def\close@column{%
1742 \newpage
1743 }%

```

19.2 Galley Style: Margin Changes

A variant of preprint processing. Emulate journal appearance somewhat.

`widetext@galley` (*env.*) 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.

```

1744 \def\galley@outdent{\rightmargin-\columnwidth\advance\rightmargin-\columnsep}%
1745 \let\widetext@outdent\@empty
1746 \newenvironment{widetext@galley}{%
1747 \list{}{%
1748 \topsep \z@skip
1749 \listparindent \parindent
1750 \itemindent \parindent
1751 \leftmargin \z@
1752 \parsep \z@\@plus\p@
1753 \widetext@outdent
1754 \relax
1755 }%
1756 \item\relax
1757 }{
1758 \endlist
1759 }%

```

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.

```

1760 \def\title@column@grid#1{%
1761 \minipagefootnote@init
1762 \onecolumngrid
1763 \begingroup
1764 \let\@footnotetext\frontmatter@footnotetext
1765 %<ignore> \let\set@footnotewidth\set@footnotewidth@two
1766 \ltx@no@footnote
1767 #1%
1768 \endgroup
1769 \twocolumngrid
1770 \minipagefootnote@foot
1771 }%
1772 \def\close@column@grid{%
1773 \balancepage@sw{%
1774 \onecolumngrid
1775 %<ignore> \twocolumngrid
1776 }{%
1777 }%

```

`widetext@grid` (*env.*) We slip into the one-column page grid within the scope of this environment.

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

```

1778 \newenvironment{widetext@grid}{%
1779 \par\ignorespaces
1780 \setbox\widetext@top\vbox{%
1781 %<ignore> \vskip15\p@
1782 \hb@xt@\hsize{%
1783 \leaders\hrule\hfil
1784 \vrule\@height6\p@
1785 }%
1786 %<ignore> \vskip6\p@
1787 }%
1788 \setbox\widetext@bot\hb@xt@\hsize{%
1789 \vrule\@depth6\p@
1790 \leaders\hrule\hfil
1791 }%
1792 \onecolumngrid
1793 \vskip10\p@
1794 \dimen@ht\widetext@top\advance\dimen@\dp\widetext@top
1795 \cleaders\box\widetext@top\vskip\dimen@
1796 %<ignore> \let\set@footnotewidth\set@footnotewidth@two
1797 \vskip6\p@
1798 \prep@math@patch
1799 }{%
1800 \par
1801 \vskip6\p@
1802 \setbox\widetext@bot\vbox{%
1803 \hb@xt@\hsize{\hfil\box\widetext@bot}%
1804 %<ignore> \vskip14\p@
1805 }%

```

```

1806 \dimen@ht\widetext@bot\advance\dimen@dp\widetext@bot
1807 \cleaders\box\widetext@bot\vskip\dimen@
1808 \vskip8.5\p@
1809 \twocolumngrid\global\@ignoretrue
1810 \@endpetrue
1811 }%
1812 \newbox\widetext@top
1813 \newbox\widetext@bot

```

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

```

1814 \def\set@page@grid{%
1815 \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.

```

1816 \let\set@footnotewidth\set@footnotewidth@two
1817 \let\compose@footnotes\compose@footnotes@two
1818 \let@environment{widetext}{widetext@grid}%
1819 \let\title@column\title@column@grid
1820 \let\close@column\close@column@grid
1821 }-%
1822 \let@environment{widetext}{widetext@galley}%
1823 \preprintsty@sw{%

```

Change the page grid not at all.

```

1824 }-%

```

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

```

1825 \galley@sw{%
1826 \let\widetext@outdent\galley@outdent
1827 }-%
1828 }%
1829 }%
1830 }%
1831 \appdef\setup@hook{\set@page@grid}%

```

20 Old font commands

```

1832 \DeclareOldFontCommand{\rm}{\normalfont\rmfamily}{\mathrm}
1833 \DeclareOldFontCommand{\sf}{\normalfont\sffamily}{\mathsf}
1834 \DeclareOldFontCommand{\tt}{\normalfont\ttfamily}{\mathtt}
1835 \DeclareOldFontCommand{\bf}{\normalfont\bfseries}{\mathbf}
1836 \DeclareOldFontCommand{\it}{\normalfont\itshape}{\mathit}
1837 \DeclareOldFontCommand{\sl}{\normalfont\slshape}{\@nomath\sl}
1838 \DeclareOldFontCommand{\sc}{\normalfont\scshape}{\@nomath\sc}
1839 \DeclareRobustCommand*\cal{\@fontswitch\relax\mathcal}
1840 \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.

```
1841 \def\today{\ifcase\month\or
1842   January\or February\or March\or April\or May\or June\or
1843   July\or August\or September\or October\or November\or December\fi
1844   \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`.

```
1845 \def\partname{Part}
```

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

```
1846 \def\tocname{Contents}
```

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

```
1847 \def\lofname{List of Figures}
```

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

```
1848 \def\lotname{List of Tables}
```

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

```
1849 \def\refname{References}
```

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

```
1850 \def\indexname{Index}
```

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

```
1851 \def\figurename{FIG.}
1852 \def\figuresname{Figures}%
```

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

```
1853 \def\tablename{TABLE}
1854 \def\tablesname{Tables}%
```

`\abstractname` Text entity `\abstractname` is used in abstract.

```
1855 \def\abstractname{Abstract}
```

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

```
\appendixname 1856 \def\appendixesname{Appendixes}%
1857 \def\appendixname{Appendix}%
```

`\acknowledgmentsname` Text entity `\acknowledgmentsname` is used in `acknowledgments`.
1858 `\def\acknowledgmentsname{Acknowledgments}`

`\journalname` This should be set by the society journal options, eg ‘pra’.
1859 `\def\journalname{??}`

`\copyrightname` Default layout does not assign copyright, but a journal that wants to might use this.
1860 `\def\copyrightname{??}`

`\andname` The text string “and” for use in author lists.
1861 `\def\andname{and}`

`\@pacs@name` The text string prepended to PACS numbers, resp. to keywords.
`\@keys@name` 1862 `\def\@pacs@name{PACS numbers: }%`
1863 `\def\@keys@name{Keywords: }%`

`\ppname` The text string “pp” for use in page ranges.
1864 `\def\ppname{pp}`

`\numbername` The text string “number” for use in article reference.
1865 `\def\numbername{number}`

`\volumename` The text string “volume” for use in article reference.
1866 `\def\volumename{volume}`

`\Dated@name` These texts are used in the `\date`, et al. commands.
`\Received@name` 1867 `\def\Dated@name{Dated: }%`
`\Revised@name` 1868 `\def\Received@name{Received }%`
`\Accepted@name` 1869 `\def\Revised@name{Revised }%`
`\Published@name` 1870 `\def\Accepted@name{Accepted }%`
1871 `\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.

```

1872 \def\address{\replace@command\address\affiliation}%
1873 \def\altaddress{\replace@command\altaddress\altaffiliation}%
1874 \newenvironment{references}{%
1875 \class@warn@end{The references environment is not supported; use thebibliography instead.}%
1876 \gdef\references{\thebibliography{}}\references
1877 }{%
1878 \endthebibliography
1879 }%
1880 \def\draft{%
1881 \class@warn@end{Command \string\draft\space is obsolete;^^JInvoke option draft instead.}%
1882 \@booleantrue\draft@sw

```

```

1883 }%
1884 \def\tighten{%
1885 \class@warn@end{Command \string\tighten\space is obsolete;^^JInvoke option tightenlines ins
1886 \@booleantrue\tightenlines@sw
1887 }%
1888 \def\tableline{%
1889 \noalign{%
1890 \class@warn@end{Command \string\tableline\space is obsolete;^^JUse \string\colrule\space i
1891 \global\let\tableline\colrule
1892 }%
1893 \tableline
1894 }%
1895 \def\case{\replace@command\case\frac}%
1896 \def\slantfrac{\replace@command\slantfrac\frac}%
1897 \def\tablenote{\replace@command\tablenote\footnote}%
1898 \def\tablenotemark{\replace@command\tablenotemark\footnotemark}%
1899 \def\tablenotetext{\replace@command\tablenotetext\footnotetext}%
1900 % Lose the following definition:
1901 \DeclareRobustCommand\REV@text[1]{%
1902 \relax
1903 \ifmmode
1904 \mathchoice
1905 {\hbox{\everymath{\displaystyle }#1}}%
1906 {\hbox{\everymath{\textstyle }#1}}%
1907 {\hbox{\everymath{\scriptstyle }#1}}%
1908 {\hbox{\everymath{\scriptscriptstyle }#1}}%
1909 \glb@settings
1910 \else
1911 \mbox{#1}%
1912 \fi
1913 }%
1914 % Lose the following definition:
1915 \DeclareRobustCommand\REV@bbox[1]{%
1916 \relax
1917 \ifmmode
1918 \mathchoice
1919 {\hbox{\everymath{\displaystyle }#1}}%
1920 {\hbox{\everymath{\textstyle }#1}}%
1921 {\hbox{\everymath{\scriptstyle }#1}}%
1922 {\hbox{\everymath{\scriptscriptstyle }#1}}%
1923 \glb@settings
1924 \else
1925 \mbox{#1}%
1926 \fi
1927 }%
1928 \DeclareRobustCommand\REV@bm[1]{%
1929 \class@warn@end{To use \string\bm, please load the bm package!}%
1930 \global\let\bm\relax
1931 }%
1932 \def\FL{\obsolete@command\FL}%
1933 \def\FR{\obsolete@command\FR}%
1934 \def\narrowtext{\obsolete@command\narrowtext}%
1935 \def\mediumtext{\obsolete@command\mediumtext}%
1936 \newenvironment{quasitable}{%

```

```

1937 \let@environment{tabular}{longtable}%
1938 }{%
1939 }%

\text If not otherwise defined, give default meanings to certain commands.  FIXME:
\bm \bibinfo?
\bibinfo 1940 \let\text\REV@text
\epprint 1941 \let\bm\REV@bm
\url 1942 \appdef\setup@hook{%
1943 \providecommand\bibinfo[2]{#2}%
1944 \providecommand\epprint[2][]{#2}%
1945 %\providecommand\url[1]{#1}%
1946 }%

\bbox
1947 \def\bbox#1{%
1948 \class@warn@end{\string\bbox\space is obsolete,^^Jload the bm package and use \string\bm\sp
1949 \global\let\bbox\relax
1950 }%

\mathletters
1951 \newenvironment{mathletters}{%
1952 \class@warn@end{Environment {mathletters} is obsolete;^^Jload the amsmath package and use {
1953 \global\let\mathletters\@empty
1954 }{%
1955 }%

\eqnum
1956 \def\eqnum#1{%
1957 \class@warn@end{\string\eqnum\space is obsolete, load the amsmath package and use \string\
1958 \global\let\eqnum@gobble
1959 }%

We read in the symbol definitions.
1960 \appdef\rtx@require@packages{%
1961 \RequirePackage{revsymb4-2}%
1962 }%
1963 \appdef\class@documenthook{\revsymb@inithook}%

```

23 Corrected Indentation for tableofcontents

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

```

1964 %%
1965 \def\@startflt#1{%
1966 \begin@group
1967 %\toc@pre
1968 \makeatletter
1969 \@input{\jobname.#1}%
1970 \if@files@w
1971 \expandafter\newwrite\csname tf@#1\endcsname
1972 \immediate\openout \csname tf@#1\endcsname \jobname.#1\relax

```

```

1973   \fi
1974   \@nobreakfalse
1975   %\toc@post
1976   \endgroup
1977 }%
1978 \def\att@TOC{toc}%
1979 \def\print@toc#1{%
1980   \begingroup
1981   \expandafter\section
1982   \expandafter*%
1983   \expandafter{%
1984     \csname#1name\endcsname
1985   }%
1986   \let\appendix\appendix@toc
1987   \def\tempa{#1}%
1988   \ifx\tempa\att@TOC%%
1989     \@starttoc{#1}%
1990   \else%%
1991     \@startflt{#1}%%
1992   \fi%%
1993   \endgroup
1994 }%
1995 %%

```

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.

```

1996 \def\LN@LError@org{%
1997   \PackageError{lineno}{%
1998     \string\linelabel\space without \string\linenumbers
1999   }{%
2000     Just see documentation. (New feature v4.11)%
2001   }%
2002   \@gobble
2003 }%
2004 \def\LN@LError@ltx{%
2005   \PackageWarning{lineno}{%
2006     To make the \string\linelabel\space command work, you must issue the \string\linenumbers\
2007   }%
2008   \@gobble
2009 }%

```

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.

```
2010 \appdef\class@documenthook{%
2011 \@ifx{\@LN@LError\@LN@LError@org}{%
2012 \class@info{Overriding \string\@LN@LError}%
2013 \let\@LN@LError\@LN@LError@ltx
2014 }{}%
2015 \@ifpackageloaded{lineno}{%
2016 \@ifxundefined{\set@linepenalties}{}%
2017 \def\prep@absbox{\set@linepenalties}%
2018 \def\post@absbox{\let\@LN@parpgbrk\@empty\@linenumberpar}%
2019 }%
2020 }{}%
2021 }%
```

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

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

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

```
2022 \appdef\rtx@require@packages{%
2023 \InputIfFileExists{\jobname.rty}{}%
2024 }%
```

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.

```
2025 \@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`.

```
2026 \@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`.

```
2027 \@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`.

```
2028 \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`.

```
2029 \@parse@class@options@\@pointsize
```

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

```
2030 \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.

```
2031 \@options
```

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

```
2032 \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.

```
2033 \appdef\setup@hook{\normalsize}%
2034 \setup@hook
```

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

```
2035 %<*ignore>
2036 \def\rtx@fin@year{2010}%
2037 \def\rtx@fin@month{01}%
2038 \def\rtx@fin@day{01}%
2039 \def\rtx@fin@warn{%
2040   \ifnum{\rtx@fin@year>\the\year\relax}{\true@sw}{%
2041     \ifnum{\rtx@fin@month>\the\month\relax}{\true@sw}{%
2042       \ifnum{\rtx@fin@day>\the\day\relax}{\true@sw}{%
2043         \false@sw
2044       }%
2045     }%
2046   }%
2047   {%
2048     \class@info{Beta software expires \rtx@fin@year-\rtx@fin@month-\rtx@fin@day; updates avail
2049   }{%
2050     \class@warn{Outdated software expired \rtx@fin@year-\rtx@fin@month-\rtx@fin@day; please r
2051   }%
2052   }%
2053 %</ignore>
```

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

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

End of the class file.

```
2054 %</package>
```

26 Symbols: the revsymb module

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

```
2055 %<*revsymb>
2056 \def\REVSYMB@warn#1{\PackageWarningNoLine{revsymb}{#1}}%
```

`\lambdabar`

```
2057 \DeclareRobustCommand\lambdabar{%
2058   \bgroup
2059     \def\@tempa{%
2060       \hbox{%
2061         \raise.73\ht\z@
```

```

2062     \hb@xt@\z@{%
2063         \kern.25\wd\z@
2064         \vrule \@width.5\wd\z@\@height.1\p@\@depth.1\p@
2065         \hss
2066     }%
2067     \box\z@
2068 }%
2069 }%
2070 \mathchoice
2071   {\setbox\z@\hbox{\displaystyle \lambda}\@tempa}%
2072   {\setbox\z@\hbox{\textstyle \lambda}\@tempa}%
2073   {\setbox\z@\hbox{\scriptstyle \lambda}\@tempa}%
2074   {\setbox\z@\hbox{\scriptscriptstyle\lambda}\@tempa}%
2075 \egroup
2076 }%

```

`\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`.

```

2077 \DeclareRobustCommand\openone{\leavevmode\hbox{\small1\normalize\kern-.33em1}}%

```

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

Any use of any of these commands will result in a warning message at the end of the log file. If the corresponding package is not loaded, a definition will quietly be provided.

```

2078 \DeclareRobustCommand\corresponds{\replace@command\corresponds\triangleq}%
2079 \DeclareRobustCommand\overcirc{\replace@command\overcirc\mathring}%
2080 \DeclareRobustCommand\overdots{\replace@command\overdots\ddot}%
2081 \DeclareRobustCommand\REV@triangleq{%
2082   {\lower.2ex\hbox{=}}{\kern-.75em\triangle}%
2083 }%
2084 \DeclareRobustCommand\REV@ddot[1]{%
2085   \@ontopof{#1}{\cdots}{1.0}\mathord{\box2}%
2086 }%

```

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

```

\lessim 2087 \DeclareRobustCommand\altsuccsim{\succ\kern-.9em_\sim\kern.3em}%
\gtrsim 2088 \DeclareRobustCommand\altprecsim{\prec\kern-1em_\sim\kern.3em}%
\alt 2089 \let\REV@succsim\altsuccsim
\agt 2090 \let\REV@precsim\altprecsim
2091 \DeclareRobustCommand\REV@lessim{\mathrel{\mathpalette\vereq{<}}}%
2092 \DeclareRobustCommand\REV@gtrsim{\mathrel{\mathpalette\vereq{>}}}%
2093 \DeclareRobustCommand\alt{\lessim}
2094 \DeclareRobustCommand\agt{\gtrsim}
2095 \def\vereq#1#2{%
2096   \lower3\p@\vbox{%
2097     \baselineskip1.5\p@
2098     \lineskip1.5\p@
2099     \ialign{\m@th#1\hfil##\hfil$\crrc#2\crrc\sim\crrc}%
2100   }%
2101 }%

```

```

\tensor
\overstar 2102 \DeclareRobustCommand\tensor[1]{\@ontopof{#1}{\lefttrightharpoonup}{1.15}\mathord{\box2}}
\loarrow 2103 \DeclareRobustCommand\overstar[1]{\@ontopof{#1}{\ast}{1.15}\mathord{\box2}}
\roarrow 2104 \DeclareRobustCommand\loarrow[1]{\@ontopof{#1}{\leftarrow}{1.15}\mathord{\box2}}
2105 \DeclareRobustCommand\roarrow[1]{\@ontopof{#1}{\rightarrow}{1.15}\mathord{\box2}}

```

```

\@ontopof
2106 \def\@ontopof#1#2#3{%
2107   {%
2108     \mathchoice
2109       {\@ontopof{#1}{#2}{#3}\displaystyle \scriptstyle }%
2110       {\@ontopof{#1}{#2}{#3}\textstyle \scriptstyle }%
2111       {\@ontopof{#1}{#2}{#3}\scriptstyle \scriptscriptstyle}%
2112       {\@ontopof{#1}{#2}{#3}\scriptscriptstyle\scriptscriptstyle}%
2113   }%
2114 }%

```

\@ontopof Same as REVTeX3, more or less.

```

2115 \def\@ontopof#1#2#3#4#5{%
2116   \setbox\z@\hbox{#4#1$}%
2117   \setbox\fo@ur\hbox{#5#2$}%
2118   \setbox\tw@\null\ht\tw@\ht\z@ \dp\tw@\dp\z@
2119   \@ifdim\wd\z@>\wd\fo@ur{%
2120     \setbox\fo@ur\hb@xt@\wd\z@{\hss\box\fo@ur\hss}%
2121     \mathord{\rlap{\raise#3\ht\z@\box\fo@ur}\box\z@}%
2122   }{%
2123     \setbox\fo@ur\hb@xt@.9\wd\fo@ur{\hss\box\fo@ur\hss}%
2124     \setbox\z@\hb@xt@\wd\fo@ur{\hss#4\relax#1\hss}%
2125     \mathord{\rlap{\copy\z@}\raise#3\ht\z@\box\fo@ur}%
2126   }%
2127 }%

```

\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.

```

2128 \DeclareRobustCommand\frak{%
2129   \REVSymbWarn{%
2130     Command \string\frak\space unsupported:^^J%
2131     please use \string\mathfrak\space instead.%
2132   }%
2133   \global\let\frak\mathfrak
2134   \frak
2135 }%
2136 \DeclareRobustCommand\REV@mathfrak{%
2137   \REVSymbWarn{%
2138     Command \string\mathfrak\space undefined:^^J%
2139     please specify the amsfonts or amssymb option!%
2140   }%
2141   \global\let\mathfrak\@firstofone
2142   \mathfrak
2143 }%

```

\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.

```

2144 \DeclareRobustCommand\Bbb{%
2145 \REVSymb@warn{%
2146 Command \string\Bbb\space unsupported:^^J%
2147 please use \string\mathbb\space instead.%
2148 }%
2149 \global\let\Bbb\mathbb
2150 \Bbb
2151 }%
2152 \DeclareRobustCommand\REV@mathfrak{%
2153 \REVSymb@warn{%
2154 Command \string\mathbb\space undefined:^^J%
2155 please specify the amsfonts or amssymb option!%
2156 }%
2157 \global\let\mathbb\@firstofone
2158 \mathbb
2159 }%

```

`\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!

```

2160 \def\Bigglb{\REV@boldopen \Big}%
2161 \def\Biglb {\REV@boldopen \Big }%
2162 \def\bigglb{\REV@boldopen \big}%
2163 \def\biglb {\REV@boldopen \big }%
2164 \def\Biggrb{\REV@boldclose\Big}%
2165 \def\Bigrb {\REV@boldclose\Big }%
2166 \def\biggrb{\REV@boldclose\big}%
2167 \def\bigrb {\REV@boldclose\big }%
2168 \def\REV@pmb#1{%
2169 \hbox{%
2170 \setbox\z@=\hbox{#1}%
2171 \kern-.02em\copy\z@\kern-\wd\z@
2172 \kern .04em\copy\z@\kern-\wd\z@
2173 \kern-.02em
2174 \raise.04em\copy\z@
2175 }%
2176 }%
2177 \def\REV@boldopen #1#2{\mathopen {\REV@pmb{#1#2}}}%
2178 \def\REV@boldclose#1#2{\mathclose{\REV@pmb{#1#2}}}%

```

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

```

2179 \def\revsymb@inithook{%
2180 \@ifundefined\dddot{\let\dddot\REV@dddot}{}%
2181 \@ifundefined\triangleq{\let\triangleq\REV@triangleq}{}%
2182 \@ifundefined\succsim{\let\succsim\altsuccsim}{}%
2183 \@ifundefined\precsim{\let\precsim\altprecsim}{}%
2184 \@ifundefined\lessim{\let\lessim\REV@lessim}{}%
2185 \@ifundefined\gtrsim {\let\gtrsim \REV@gtrsim }{%
2186 \@ifundefined\mathfrak{\let\mathfrak\REV@mathfrak}{}%
2187 \@ifundefined\mathbb{\let\mathbb\REV@mathbb}{}%
2188 }%
2189 %</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.

```
2190 %<*10pt>
```

27.1 Defend Against Forseeable Errors

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

```
2191 \ifx\undefined\substyle@ext
2192 \def\@tempa{%
2193 \endinput
2194 \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
2195 }%
2196 \expandafter\else
2197 \def\@tempa{%
2198 \expandafter\fi\@tempa
2199 \class@info{RevTeX pointsize 10pt selected}%

2200 \def\normalsize{%
2201 \setfontsize\normalsize\@xpt{11.5}%
2202 \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2203 \belowdisplayskip \abovedisplayskip
2204 \abovedisplayshortskip \abovedisplayskip
2205 \belowdisplayshortskip \abovedisplayskip
2206 \let\@listi\@listI
2207 }%

2208 \def\small{%
2209 \setfontsize\small\@ixpt{10.5}%
2210 \abovedisplayskip 8.5\p@ \@plus3\p@ \@minus4\p@
2211 \belowdisplayskip \abovedisplayskip
2212 \abovedisplayshortskip \z@ \@plus2\p@
2213 \belowdisplayshortskip 4\p@ \@plus2\p@ \@minus2\p@
2214 \def\@listi{%
2215 \leftmargin\leftmarginI
2216 \topsep 4\p@ \@plus2\p@ \@minus2\p@
2217 \parsep 2\p@ \@plus\p@ \@minus\p@
2218 \itemsep \parsep
2219 }%
2220 }%

2221 \def\footnotesize{%
2222 \setfontsize\footnotesize\@viiipt{9.5pt}%
2223 \abovedisplayskip 6\p@ \@plus2\p@ \@minus4\p@
2224 \belowdisplayskip \abovedisplayskip
2225 \abovedisplayshortskip \z@ \@plus\p@
2226 \belowdisplayshortskip 3\p@ \@plus\p@ \@minus2\p@
2227 \def\@listi{%
2228 \leftmargin\leftmarginI
2229 \topsep 3\p@ \@plus\p@ \@minus\p@
2230 \parsep 2\p@ \@plus\p@ \@minus\p@
2231 \itemsep \parsep
2232 }%
2233 }%
```

```

2234 \def\scriptsize{%
2235 \@setfontsize\scriptsize\@viipt\@viipt
2236 }%
2237 \def\tiny{%
2238 \@setfontsize\tiny\@vpt\@vpt
2239 }%
2240 \def\large{%
2241 \@setfontsize\large\@xiipt{14pt}%
2242 }%
2243 \def\Large{%
2244 \@setfontsize\Large\@xivpt{18pt}%
2245 }%
2246 \def\LARGE{%
2247 \@setfontsize\LARGE\@xviipt{22pt}%
2248 }%
2249 \def\huge{%
2250 \@setfontsize\huge\@xxpt{25pt}%
2251 }%
2252 \def\Huge{%
2253 \@setfontsize\Huge\@xxvpt{30pt}%
2254 }%

```

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`.

```

2255 \appdef\setup@hook{%
2256 \twoside@sw{%
2257 % \oddsidemargin -.1in
2258 % \evensidemargin -.4in
2259 \oddsidemargin -20pt
2260 \evensidemargin -20pt
2261 \marginparwidth 107pt
2262 }{%
2263 \oddsidemargin -.25in
2264 \evensidemargin -.25in
2265 \marginparwidth 30pt
2266 }%
2267 }%

2268 \marginparsep 6pt

2269 \topmargin -61pt

2270 \headheight 25pt
2271 \headsep 16pt

2272 \topskip 10pt
2273 \splittopskip\topskip

2274 \footskip 30pt

2275 \textheight = 56pc

2276 \textwidth42.5pc

2277 \columnsep 1.5pc
2278 \columnseprule 0pt

```



```

2279 \footnotesep 1pt
2280 \skip\footins 39pt plus 4pt minus 12pt
2281 \def\footnoterule{%
2282 \dimen@\skip\footins\divide\dimen@\tw@
2283 \kern-\dimen@\hrule width.5in\kern\dimen@
2284 }%

2285 \floatsep 12pt plus 2pt minus 2pt
2286 \textfloatsep 20pt plus 2pt minus 4pt
2287 \intextsep 12pt plus 2pt minus 2pt

2288 \dblfloatsep 12pt plus 2pt minus 2pt
2289 \dbltextfloatsep 20pt plus 2pt minus 4pt

2290 \@fptop 0pt plus 1fil
2291 \@fpsep 8pt plus 2fil
2292 \@fpbot 0pt plus 1fil
2293 \@dblftop 0pt plus 1fil
2294 \@dblfpsep 8pt plus 2fil
2295 \@dblfpbot 0pt plus 1fil

2296 \marginparpush 5pt

2297 \parskip 0pt plus 1pt
2298 \parindent 10pt
2299 \emergencystretch8\p@

2300 \partopsep 2pt plus 1pt minus 1pt

2301 \leftmargini 25pt
2302 \leftmarginii 22pt
2303 \leftmarginiii 18.7pt
2304 \leftmarginiv 17pt
2305 \leftmarginv 10pt
2306 \leftmarginvi 10pt

2307 \def\@listI{%
2308 \leftmargin\leftmargini
2309 \parsep 4\p@ plus2\p@ minus\p@
2310 \topsep 8\p@ plus2\p@ minus4\p@
2311 \itemsep 4\p@ plus2\p@ minus\p@
2312 }%

2313 \labelsep 4pt

2314 \def\@listii{%
2315 \leftmargin\leftmarginii
2316 \labelwidth\leftmarginii
2317 \advance\labelwidth-\labelsep
2318 \topsep 4\p@ plus2\p@ minus\p@
2319 \parsep 2\p@ plus\p@ minus\p@
2320 \itemsep \parsep
2321 }%

2322 \def\@listiii{%
2323 \leftmargin\leftmarginiii
2324 \labelwidth\leftmarginiii
2325 \advance\labelwidth-\labelsep
2326 \topsep 2\p@ plus\p@ minus\p@
2327 \parsep \z@

```

```

2328 \partopsep \p@ plus\z@ minus\p@
2329 \itemsep \topsep
2330 }%

2331 \def\@listiv{%
2332 \leftmargin\leftmarginiv
2333 \labelwidth\leftmarginiv
2334 \advance\labelwidth-\labelsep
2335 }%

2336 \def\@listv{%
2337 \leftmargin\leftmarginv
2338 \labelwidth\leftmarginv
2339 \advance\labelwidth-\labelsep
2340 }%

2341 \def\@listvi{%
2342 \leftmargin\leftmarginvi
2343 \labelwidth\leftmarginvi
2344 \advance\labelwidth-\labelsep
2345 }%

2346 %</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.

```
2347 %<*11pt>
```

28.1 Defend Against Forseeable Errors

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

```

2348 \ifx\undefined\substyle@ext
2349 \def\@tempa{%
2350 \endinput
2351 \GenericWarning{I must be read in by REVTeX! (Bailing out)}}%
2352 }%
2353 \expandafter\else
2354 \def\@tempa{%
2355 \expandafter\fi\@tempa
2356 \class@info{RevTeX pointsize 11pt selected}}%

2357 \def\normalsize{%
2358 \setfontsize\normalsize\@xipt{13.6}%
2359 \abovedisplayskip 11\p@ \@plus3\p@ \@minus6\p@
2360 \belowdisplayskip \abovedisplayskip
2361 \abovedisplayshortskip \abovedisplayskip
2362 \belowdisplayshortskip \abovedisplayskip
2363 \let\@listi\@listI
2364 }%

2365 \def\small{%
2366 \setfontsize\small\@xpt\@xiipt
2367 \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2368 \abovedisplayshortskip \z@ \@plus3\p@

```

```

2369 \belowdisplayshortskip 6\p@ \@plus3\p@ \@minus3\p@
2370 \def\@listi{\leftmargin\leftmargini
2371         \topsep 6\p@ \@plus2\p@ \@minus2\p@
2372         \parsep 3\p@ \@plus2\p@ \@minus\p@
2373         \itemsep \parsep
2374 }%
2375 \belowdisplayskip \abovedisplayskip
2376 }%

2377 \def\footnotesize{%
2378   \@setfontsize\footnotesize\@ixpt{11}%
2379   \abovedisplayskip 8\p@ \@plus2\p@ \@minus4\p@
2380   \abovedisplayshortskip \z@ \@plus\p@
2381   \belowdisplayshortskip 4\p@ \@plus2\p@ \@minus2\p@
2382   \def\@listi{\leftmargin\leftmargini
2383           \topsep 4\p@ \@plus2\p@ \@minus2\p@
2384           \parsep 2\p@ \@plus\p@ \@minus\p@
2385           \itemsep \parsep
2386   }%
2387   \belowdisplayskip \abovedisplayskip
2388 }%

2389 \def\scriptsize{%
2390   \@setfontsize\scriptsize\@viiipt{9.5}%
2391 }%
2392 \def\tiny{%
2393   \@setfontsize\tiny\@vpt\@viipt
2394 }%
2395 \def\large{%
2396   \@setfontsize\large\@xipt{14}%
2397 }%
2398 \def\Large{%
2399   \@setfontsize\Large\@xivpt{18}%
2400 }%
2401 \def\LARGE{%
2402   \@setfontsize\LARGE\@xviipt{22}%
2403 }%
2404 \def\huge{%
2405   \@setfontsize\huge\@xxpt{25pt}%
2406 }%
2407 \def\Huge{%
2408   \@setfontsize\Huge\@xxvpt{30pt}%
2409 }%
2410 %</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.

```
2411 %<*12pt>
```

29.1 Defend Against Forseeable Errors

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

```
2412 \ifx\undefined\substyle@ext
2413 \def\@tempa{%
2414 \endinput
2415 \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
2416 }%
2417 \expandafter\else
2418 \def\@tempa{%
2419 \expandafter\fi\@tempa
2420 \class@info{RevTeX pointsize 12pt selected}%
2421 \def\normalsize{%
2422 \@setfontsize\normalsize\@xiipt{14pt}%
2423 \abovedisplayskip 12\p@ \@plus3\p@ \@minus7\p@
2424 \belowdisplayskip \abovedisplayskip
2425 \abovedisplayshortskip \z@ plus3\p@
2426 \belowdisplayshortskip 6.5\p@ \@plus3.5\p@ \@minus3\p@
2427 \let\@listi\@listI
2428 }%
2429 \def\small{%
2430 \@setfontsize\small\@xipt{14.5pt}%
2431 \abovedisplayskip 8\p@ \@plus3\p@ \@minus6\p@
2432 \belowdisplayskip \abovedisplayskip
2433 \abovedisplayshortskip \z@ \@plus3\p@
2434 \belowdisplayshortskip 6.5\p@ \@plus3.5\p@ \@minus3\p@
2435 \def\@listi{%
2436 \leftmargin\leftmarginI
2437 \topsep 9\p@ \@plus3\p@ \@minus5\p@
2438 \parsep 4.5\p@ \@plus2\p@ \@minus\p@
2439 \itemsep \parsep
2440 }%
2441 }%
2442 \def\footnotesize{%
2443 \@setfontsize\footnotesize\@xpt{14.5pt}%
2444 \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
2445 \belowdisplayskip \abovedisplayskip
2446 \abovedisplayshortskip \z@ \@plus3\p@
2447 \belowdisplayshortskip 6\p@ \@plus3\p@ \@minus3\p@
2448 \def\@listi{%
2449 \leftmargin\leftmarginI
2450 \topsep 6\p@ \@plus2\p@ \@minus2\p@
2451 \parsep 3\p@ \@plus2\p@ \@minus\p@
2452 \itemsep \parsep
2453 }%
2454 }%
2455 \def\scriptsize{%
2456 \@setfontsize\scriptsize\@viiipt{9.5pt}%
2457 }%
2458 \def\tiny{%
2459 \@setfontsize\tiny\@viipt{7pt}%
```

```

2460 }%
2461 \def\large{%
2462   \@setfontsize\large\@xivpt{18pt}%
2463 }%
2464 \def\Large{%
2465   \@setfontsize\Large\@xviipt{22pt}%
2466 }%
2467 \def\LARGE{%
2468   \@setfontsize\LARGE\@xxpt{25pt}%
2469 }%
2470 \def\huge{%
2471   \@setfontsize\huge\@xxvpt{30pt}%
2472 }%
2473 \let\Huge=\huge
2474 %</12pt>

```

30 Page parameters

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

```

2475 %<*11pt|12pt>
2476 \appdef\setup@hook{%
2477   \twoside@sw{%
2478     \oddsidemargin Opt
2479     \evensidemargin Opt
2480     \marginparwidth 60pt
2481   }{%
2482     \oddsidemargin Opt
2483     \evensidemargin Opt
2484     \marginparwidth 44pt
2485   }%
2486 }%
2487 \marginparsep 10pt
2488 \topmargin -37pt
2489 \headheight 12pt
2490 \headsep 25pt
2491 \topskip 10pt
2492 \splittopskip\topskip
2493 \footskip 30pt
2494 \textheight=665.5\p@
2495 \appdef\setup@hook{%
2496   \tightenlines@sw{%
2497     \def\baselinestretch{1}%
2498   }{%
2499     \def\baselinestretch{1.5}%
2500   }%
2501 }%
2502 \textwidth 468pt

```

```

2503 \columnsep 10pt
2504 \columnseprule 0pt

2505 \footnotesep 1pt
2506 \skip\footins 25.25pt plus 4pt minus 12pt
2507 \def\footnoterule{%
2508 \dimen@\skip\footins\divide\dimen@\f@ur
2509 \kern-\dimen@\hrule width.5in\kern\dimen@
2510 }%

2511 \floatsep 14pt plus 2pt minus 4pt
2512 \textfloatsep 20pt plus 2pt minus 4pt
2513 \intextsep 14pt plus 4pt minus 4pt

2514 \dblfloatsep 14pt plus 2pt minus 4pt
2515 \dbltextfloatsep 20pt plus 2pt minus 4pt

2516 \@fptop 0pt plus 1fil
2517 \@fpsep 10pt plus 2fil
2518 \@fpbot 0pt plus 1fil
2519 \@dblftop 0pt plus 1fil
2520 \@dblfpsep 10pt plus 2fil%
2521 \@dblfpbot 0pt plus 1fil

2522 \marginparpush 7pt

2523 \parskip 0pt plus 1pt
2524 \parindent 15pt
2525 \emergencystretch8\p@
2526 \partopsep 3pt plus 2pt minus 2pt

2527 \leftmargini 30pt
2528 \leftmarginii 26pt
2529 \leftmarginiii 22pt
2530 \leftmarginiv 20pt
2531 \leftmarginv 12pt
2532 \leftmarginvi 12pt

2533 \def\@listI{\leftmargin\leftmargini \parsep 5\p@ plus2.5\p@ minus\p@
2534 \topsep 10\p@ plus4\p@ minus6\p@
2535 \itemsep 5\p@ plus2.5\p@ minus\p@
2536 }%

2537 \labelsep 6pt

2538 \def\@listii{\leftmargin\leftmarginii
2539 \labelwidth\leftmarginii\advance\labelwidth-\labelsep
2540 \topsep 5\p@ plus2.5\p@ minus\p@
2541 \parsep 2.5\p@ plus\p@ minus\p@
2542 \itemsep \parsep
2543 }%

2544 \def\@listiii{\leftmargin\leftmarginiii
2545 \labelwidth\leftmarginiii\advance\labelwidth-\labelsep
2546 \topsep 2.5\p@ plus\p@ minus\p@
2547 \parsep \z@ \partopsep \p@ plus\z@ minus\p@
2548 \itemsep \topsep
2549 }%

2550 \def\@listiv{\leftmargin\leftmarginiv
2551 \labelwidth\leftmarginiv\advance\labelwidth-\labelsep
2552 }%

```

```

2553 \def\@listv{\leftmargin\leftmarginv
2554 \labelwidth\leftmarginv\advance\labelwidth-\labelsep
2555 }%
2556 \def\@listvi{\leftmargin\leftmarginvi
2557 \labelwidth\leftmarginvi\advance\labelwidth-\labelsep
2558 }%
2559 %</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`.

```

2560 %<*aps>

```

31.1 Defend Against Forseeable Errors

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

```

2561 \ifx\undefined\substyle@ext
2562 \def\@tempa{%
2563 \endinput
2564 \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
2565 }%
2566 \expandafter\else
2567 \def\@tempa{%
2568 \expandafter\fi\@tempa
2569 \class@info{RevTeX society APS selected}%

```

Here are the class options relating to the APS:

```

2570 \DeclareOption{pra}{\change@journal{pra}}%
2571 \DeclareOption{prb}{\change@journal{prb}}%
2572 \DeclareOption{prc}{\change@journal{prc}}%
2573 \DeclareOption{prd}{\change@journal{prd}}%
2574 \DeclareOption{pre}{\change@journal{pre}}%
2575 \DeclareOption{prl}{\change@journal{prl}}%
2576 %\changes{4.2b}{2017/11/21}{(MD) Update options for new titles without "Special Topics" and
2577 \DeclareOption{prab}{\change@journal{prab}}%
2578 \DeclareOption{prper}{\change@journal{prper}}%
2579 \DeclareOption{rmp}{\change@journal{rmp}}%
2580 %\changes{4.2b}{2017/11/21}{(MD) Add options for new APS journals and a generic physrev opti
2581 \DeclareOption{prx}{\change@journal{prx}}%
2582 \DeclareOption{prapplied}{\change@journal{prapplied}}%
2583 \DeclareOption{prmaterals}{\change@journal{prmaterals}}%
2584 \DeclareOption{prfluids}{\change@journal{prfluids}}%
2585 \DeclareOption{physrev}{\change@journal{physrev}}%

```

31.2 Abbreviations

The following macros constitute typing shortcuts for certain journal names.

```

2586 \def\adv{AIP Advances}%
2587 \def\ao{Appl. \ Opt.}%
2588 \def\ap{Appl. \ Phys.}%
2589 \def\apl{Appl. \ Phys. \ Lett.}%
2590 \def\apm{Appl. \ Phys. \ Lett. \ Mater.}%
2591 \def\apj{Astrophys. \ J.}%
2592 \def\bell{Bell Syst. \ Tech. \ J.}%
2593 \def\bmf{Biomicrofluidics}%
2594 \def\cha{Chaos}%
2595 \def\jqe{IEEE J. \ Quantum Electron.}%
2596 \def\assp{IEEE Trans. \ Acoust. \ Speech Signal Process.}%
2597 \def\aprop{IEEE Trans. \ Antennas Propag.}%
2598 \def\mtt{IEEE Trans. \ Microwave Theory Tech.}%
2599 \def\iovs{Invest. \ Ophthalmol. \ Vis. \ Sci.}%
2600 \def\jcp{J. \ Chem. \ Phys.}%
2601 \def\jap{J. \ Appl. \ Phys.}%
2602 \def\jmp{J. \ Math. \ Phys.}%
2603 \def\jmo{J. \ Mod. \ Opt.}%
2604 \def\josa{J. \ Opt. \ Soc. \ Am.}%
2605 \def\josaa{J. \ Opt. \ Soc. \ Am. \ A}%
2606 \def\josab{J. \ Opt. \ Soc. \ Am. \ B}%
2607 \def\jpp{J. \ Phys. \ (Paris)}%
2608 \def\jpr{J. \ Phys. \ Chem. \ Ref. \ Data}%
2609 \def\ltp{Low. \ Temp. \ Phys.}%
2610 \def\nat{Nature (London)}%
2611 \def\oc{Opt. \ Commun.}%
2612 \def\ol{Opt. \ Lett.}%
2613 \def\pl{Phys. \ Lett.}%
2614 \def\pop{Phys. \ Plasmas}%
2615 \def\pof{Phys. \ Fluids}%
2616 \def\pra{Phys. \ Rev. \ A}%
2617 \def\prb{Phys. \ Rev. \ B}%

```



```

2618 \def\prc{Phys.\ Rev.\ C}%
2619 \def\prd{Phys.\ Rev.\ D}%
2620 \def\pre{Phys.\ Rev.\ E}%
2621 \def\prl{Phys.\ Rev.\ Lett.}%
2622 \def\rmp{Rev.\ Mod.\ Phys.}%
2623 \def\rsi{Rev.\ Sci.\ Instrum.}%
2624 \def\rse{J.\ Renewable Sustainable Energy}%
2625 \def\pspie{Proc.\ Soc.\ Photo-Opt.\ Instrum.\ Eng.}%
2626 \def\sjqe{Sov.\ J.\ Quantum Electron.}%
2627 \def\vr{Vision Res.}%
2628 \def\sd{Structural\ Dynamics}%
2629 \def\jor{J.\ Rheol.}%
2630 \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 $\LaTeX 2_{\epsilon}$ (`revtex4-2.dtxltxltx`).

```

2631 \def\@fnsymbol#1{%
2632 \ensuremath{%
2633 \ifcase#1\or
2634 *\or
2635 \dagger\or
2636 \ddagger\or
2637 \mathsection\or
2638 \mathparagraph\or
2639 % \|\or
2640 **\or
2641 \dagger\dagger\or
2642 \ddagger\ddagger\or
2643 \mathsection\mathsection\or
2644 \mathparagraph\mathparagraph\or
2645 ***\or
2646 \dagger\dagger\dagger\or
2647 \ddagger\ddagger\ddagger\or
2648 \mathsection\mathsection\mathsection\or
2649 \mathparagraph\mathparagraph\mathparagraph

```

```

2650 \else
2651 \ctrerr
2652 \fi
2653 }%
2654 }%
2655 \appdef\document@inithook{%
2656 \@ifxundefined\TextOrMath{%
2657 \DeclareRobustCommand\TextOrMath{\@ifmode{\false@sw}{\true@sw}}%
2658 }{}%
2659 }%
2660 \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.

```

2661 \clo@groupedaddress

```

`\titlepage`

```

2662 \renewenvironment{titlepage}{%
2663 \let\wastwocol@sw\twocolumn@sw
2664 \onecolumngrid
2665 \newpage
2666 \thispagestyle{titlepage}%
2667 \c@page\z@
A comment: "article.cls sets this to one not zero?"
2668 }{%
2669 \wastwocol@sw\twocolumngrid}\newpage}%
2670 }%

```

`\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.

```

2671 \def\frontmatter@abstractheading{%
2672 \preprintsty@sw{%
2673 \begingroup
2674 \centering\large
2675 \abstractname
2676 \par
2677 \endgroup
2678 }{}%
2679 }%

```

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

```

2680 \def\frontmatter@abstractwidth{400\p@}%

```

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

```

2681 \def\frontmatter@abstractfont{%
2682 \small
2683 \parindent1em\relax
2684 \adjust@abstractwidth
2685 }%
2686 \def\adjust@abstractwidth{%
2687 \dimen@textwidth\advance\dimen@-\frontmatter@abstractwidth
2688 \divide\dimen@\tw@

```

```

2689 \galley@sw{%
2690 \advance\rightskip\tw@\dimen@
2691 }{%
2692 \advance\leftskip\dimen@
2693 \advance\rightskip\dimen@
2694 }%
2695 \@totalleftmargin\leftskip
2696 }%

```

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`.

```

2697 \@booleanfalse\preprintsty@sw
2698 \@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.

```

2699 \appdef\setup@hook{%
2700 \preprintsty@sw{%
2701 \ps@preprint
2702 \def\frontmatter@abstractwidth{\textwidth}%
2703 \def\frontmatter@affiliationfont{\it}%
2704 \let\section\section@preprintsty

```

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

```

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

```

```

2705 \let\subsection\subsection@preprintsty
2706 \let\subsubsection\subsubsection@preprintsty
2707 }{%
2708 \ps@article
2709 }%
2710 }%

```

`\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.

```

2711 \def\frontmatter@authorformat{%
2712 \skip@\@flushglue
2713 \@flushglue\z@ plus.3\hsize\relax
2714 \centering
2715 \advance\baselineskip\p@
2716 \parskip11.5\p@\relax
2717 \@flushglue\skip@

```

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

```

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

2718 }%

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

```
2719 \def\frontmatter@above@affilgroup{%
```

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

```

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

2720 }%

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

`@matter@above@affiliation@script`

```
2721 \def\frontmatter@above@affiliation@script{%
```

```
2722 \skip@\@flushglue
2723 \@flushglue\z@ plus.3\hsize\relax
2724 \centering
2725 \@flushglue\skip@
2726 \addvspace{3.5\p@}%
2727 }%
```

```
2728 \def\frontmatter@above@affiliation{%
```

```
2729 \preprintsty@sw}{-%
```

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

```

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

2730 }%

2731 }%

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

```
2732 \def\frontmatter@affiliationfont{%
```

```
2733 \small\it
```

```
2734 }%
```

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

```
2735 \def\frontmatter@collaboration@above{%
```

```
2736 \preprintsty@sw{%
```

```
2737 }{%
```

```
2738 \parskip1.5\p@\relax
```

```
2739 }%
```

```
2740 }%
```

`\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.

```
2741 \def\frontmatter@setup{%
```

```
2742 \normalfont
```

```
2743 }%
```

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

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

`\frontmatter@title@below` 2744 `\def\frontmatter@title@above{\addvspace{6\p@}}%`
2745 `\def\frontmatter@title@format{\large\bfseries\centering\parskip\z@skip}%`
2746 `\def\frontmatter@title@below{}`%

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

2747 `\def\@author@parskip{3\p@}%`
2748 `\def\frontmatter@makefnmark{%`
2749 `\@textsuperscript{%`
2750 `\normalfont\@thefnmark`
2751 `}%`
2752 `}%`
2753 `\def\frontmatter@authorbelow{%`
2754 `\addvspace{3\p@}%`
2755 `}%`

`\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.

2756 `\def\frontmatter@RRAP@format{%`
2757 `\small`
2758 `\centering`

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

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

2759 `\everypar{\hbox\bgroup(\@gobble@leavemode@uppercase}%`
2760 `\def\par{\@ifvmode{\unskip}\egroup\@par}}%`
2761 `}%`
2762 `\def\punct@RRAP{;\egroup\ \hbox\bgroup}%`
2763 `\def\@gobble@leavemode@uppercase#1#2{\expandafter\MakeTextUppercase}%`

`\frontmatter@PACS@format`

2764 `\def\frontmatter@PACS@format{%`
2765 `\addvspace{11\p@}%`
2766 `\footnotesize`
2767 `\adjust@abstractwidth`
2768 `\parindent\z@`
2769 `\parskip\z@skip`
2770 `\samepage`
2771 `}%`

`\frontmatter@keys@format`

2772 `\def\frontmatter@keys@format{%`
2773 `\footnotesize`
2774 `\adjust@abstractwidth`
2775 `\parindent\z@`
2776 `\samepage`
2777 `}%`

`\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.

```

2778 \def\ps@titlepage{%
2779   \def\@oddhead{%
2780     \hfill
2781     \preprint@sw{%
2782       \expandafter\produce@preprints\expandafter{\@preprint}%
2783     }{%
2784   }%
2785   \let\@evenhead\@oddhead
2786   \def\@oddfoot{%
2787     \hb@xt@\z@{\byrevtex\hss}%
2788     \hfil
2789     \preprintsty@sw{\thepage}{}%
2790     \quad\checkindate
2791     \hfil
2792   }%
2793   \let\@evenfoot\@oddfoot
2794 }%
2795 \def\byrevtex{\byrevtex@sw{Typeset by REV\TeX}{}}%

```

`\produce@preprints`

```

2796 \def\produce@preprints#1{%
2797   \vtop to \z@{%
2798     \def\baselinestretch{1}%
2799     \small
2800     \let\preprint\preprint@count
2801     \count@\z@
2802     #1%
2803     \@ifnum{\count@>\tw@}{%
2804       \hbox{%
2805         \let\preprint\preprint@hlist
2806         #1%
2807         \setbox\z@\lastbox
2808       }%
2809     }{%
2810       \let\preprint\preprint@cr
2811       \halign{\hfil##\cr#1\crcr}%
2812       \par
2813       \vss
2814     }%
2815   }%
2816 }%
2817 \def\preprint@cr#1{#1\cr}%
2818 \def\preprint@count#1{\advance\count@\@ne}%
2819 \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.

```

2820 \def\@secntformat#1{\csname the#1\endcsname.\quad}%
2821 \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.

```

2822 \def\section{%
2823   \@startsection
2824     {section}%
2825     {1}%
2826     {\z@}%
2827     {0.8cm \@plus1ex \@minus .2ex}%
2828     {0.5cm}%
2829     {%
2830       \normalfont\small\bfseries
2831       \centering
2832     }%
2833 }%
2834 \def\@hangfrom@section#1#2#3{\@hangfrom{#1#2}\MakeTextUppercase{#3}}%
2835 \def\@hangfroms@section#1#2{#1\MakeTextUppercase{#2}}%

2836 \def\subsection{%
2837   \@startsection
2838     {subsection}%
2839     {2}%
2840     {\z@}%
2841     {.8cm \@plus1ex \@minus .2ex}%
2842     {.5cm}%
2843     {%
2844       \normalfont\small\bfseries
2845       \centering
2846     }%
2847 }%

2848 \def\subsubsection{%
2849   \@startsection
2850     {subsubsection}%
2851     {3}%
2852     {\z@}%
2853     {.8cm \@plus1ex \@minus .2ex}%
2854     {.5cm}%
2855     {%
2856       \normalfont\small\itshape
2857       \centering
2858     }%
2859 }%

```

31.3.3 Runin Heads

```

2860 \def\paragraph{%
2861   \@startsection
2862     {paragraph}%
2863     {4}%

```

```

2864     {\parindent}%
2865     {\z@}%
2866     {-1em}%
2867     {\normalfont\normalsize\itshape}%
2868 }%

2869 \def\subparagraph{%
2870   \@startsection
2871     {subparagraph}%
2872     {5}%
2873     {\parindent}%
2874     {3.25ex \@plus1ex \@minus .2ex}%
2875     {-1em}%
2876     {\normalfont\normalsize\bfseries}%
2877 }%

```

`\section@preprintsty` Here are the formatting procedures specific to the preprint style; the only difference
`\subsection@preprintsty` is that the heads are flush left instead of centered.

```

\subsection@preprintsty 2878 \def\section@preprintsty{%
2879   \@startsection
2880     {section}%
2881     {1}%
2882     {\z@}%
2883     {0.8cm \@plus1ex \@minus .2ex}%
2884     {0.5cm}%
2885     {%
2886       \normalfont\small\bfseries
2887     }%
2888   \centering
2889 }%
2890 %\def\@hangfrom@section@preprintsty#1#2#3{\@hangfrom{#1#2}\MakeTextUppercase{#3}}%

2891 \def\subsection@preprintsty{%
2892   \@startsection
2893     {subsection}%
2894     {2}%
2895     {\z@}%
2896     {.8cm \@plus1ex \@minus .2ex}%
2897     {.5cm}%
2898     {%
2899       \normalfont\small\bfseries
2900     }%
2901   \centering
2902 }%

2903 \def\subsubsection@preprintsty{%
2904   \@startsection
2905     {subsubsection}%
2906     {3}%
2907     {\z@}%
2908     {.8cm \@plus1ex \@minus .2ex}%
2909     {.5cm}%
2910     {%
2911       \normalfont\small\itshape
2912     }%
2913   \centering
2914 }%

```



```
2914 }%
```

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.

```
2915 \def\pnumwidth{1.55em}%
2916 \def\tocrmarg {2.55em}%
2917 \def\dotsep{2}%
2918 \def\ltxu@dotsep{4.5pt}%
2919 \setcounter{tocdepth}{3}%

2920 \def\tableofcontents{%
2921 \addtocontents{toc}{\string\tocdepth@munge}%
2922 \print@toc{toc}%
2923 \addtocontents{toc}{\string\tocdepth@restore}%
2924 }%

2925 \def\tocdepth@munge{%
2926 \let\l@section@saved\l@section
2927 \let\l@section\@gobble@tw@
2928 }%
2929 \def\@gobble@tw@#1#2{}%

2930 \def\tocdepth@restore{%
2931 \let\l@section\l@section@saved
2932 }%
```

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

```
2933 \def\l@part#1#2{\addpenalty{\@secpenalty}}%
2934 \begingroup
2935 \set@tocdim@pagenum\@tempboxa{#2}%
2936 % \@tempdima 3em %
2937 \parindent \z@
2938 \rightskip\tocleft@pagenum plus 1fil\relax
2939 \skip@\parfillskip\parfillskip\z@
2940 \addvspace{2.25em plus\p@}%
2941 \large \bf %
2942 \leavevmode\ignorespaces#1\unskip\nobreak\hskip\skip@
2943 \hb@xt@\rightskip{\hfil\unhbox\@tempboxa}\hskip-\rightskip\hskip\z@skip
2944 \par
2945 \nobreak %
2946 \endgroup
2947 }%
```

`\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.

```
2948 \def\tocleft@{\z@}%
```

```

2949 \def\tocdim@min{5\p@}%
2950 \def\l@section{%
2951 \l@sections{}{section}% Implicit #3#4
2952 }%
2953 \def\l@f@section{%
2954 \addpenalty{\@secpenalty}%
2955 \addvspace{1.0em plus\p@}%
2956 %\bf
2957 }%
2958 \def\l@subsection{%
2959 \l@sections{section}{subsection}% Implicit #3#4
2960 }%
2961 \def\l@subsubsection{%
2962 \l@sections{subsection}{subsubsection}% Implicit #3#4
2963 }%
2964 \def\l@paragraph#1#2{%
2965 \def\l@subparagraph#1#2{%

```

Activate the auto TOC processing.

```

2966 \let\toc@pre\toc@pre@auto
2967 \let\toc@post\toc@post@auto

```

31.3.5 Default column bottom

All APS journal styles have flush bottoms.

```

2968 \@booleanfalse\raggedcolumn@sw

```

31.3.6 Table alignment style

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

```

\tableleft@skip@float 2969 \def\tableleft@skip@float{\z@ plus\hsize}%
\array@row@pre@float 2970 \def\tabmid@skip@float{\@flushglue}%
\array@row@pst@float 2971 \def\tabright@skip@float{\z@ plus\hsize}%
2972 \def\array@row@pre@float{\hline\hline\noalign{\vskip\doublerulesep}}%
2973 \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
2974 \long\def\@makefntext#1{%
2975 \def\baselinestretch{1}%
2976 \leftskip1em%
2977 \parindent1em%
2978 \noindent
2979 \nobreak\hskip-\leftskip
2980 \hb@xt@\leftskip{%
2981 \hss\@makefnmark\ %
2982 }%
2983 #1%
2984 \par
2985 }%

```

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

```

2986 \long\def\frontmatter@makefn#1{%
2987 \def\baselinestretch{1}%
2988 \leftskip1em%
2989 \parindent1em%
2990 \noindent
2991 \nobreak\hskip-\leftskip
2992 \Hy@raisedlink{\hyper@anchorstart{frontmatter.\expandafter\the\csname c@\@mpfn\endcsname}\h
2993 \hb@xt@\leftskip{%
2994 \hss\@makefnmark\ %
2995 }%
2996 #1%
2997 \par
2998 }%

```

31.3.8 Appendix

```

\appendix
\@hangfrom@appendix 2999 \prepdef\appendix{%
\@hangfroms@appendix 3000 \par
\@appendixcntformat 3001 \let\@hangfrom@section\@hangfrom@appendix
3002 %\let\@hangfroms@section\@hangfroms@appendix
3003 \let\@sectioncntformat\@appendixcntformat
3004 }%
3005 \def\@hangfrom@appendix#1#2#3{%
3006 #1%
3007 \@ifempty{#2}{%
3008 #3%
3009 }{%
3010 #2\@ifempty{#3}{\ #3}%
3011 }%
3012 }%
3013 \def\@hangfroms@appendix#1#2{%
3014 #1#2%
3015 }%
3016 \def\@appendixcntformat#1{\appendixname\ \csname the#1\endcsname}%

```

31.3.9 Bibliography

Customize REV_TE_X for the journal substyle; this task requires three components: the BIB_TE_X `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 BIB_TE_X 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: I: `lang`—Use language field to switch hyphenation patterns for title

2. PRESENTATIONS: **b**: `pres,pres-bf`—Presentation, speaker bold face
3. ORDERING OF REFERENCES: **c**: `seq-no`—Citation order (unsorted, like `unsrt.bst`)
4. ORDER ON VON PART: **x**: `vonx`—Sort without von part (de la Maire after Mahone)
5. AUTHOR NAMES: **i**: `nm-init,ed-au`—Initials + surname (J. F. Smith)
6. POSITION OF JUNIOR: *****: `jnr1st`—Junior comes last as Smith, John, Jr.
7. TYPEFACE FOR AUTHORS IN LIST OF REFERENCES: **u**: `nmft,nmft-def`—User defined author font (`\bibnamefont`)
8. FONT FOR FIRST NAMES: **u**: `fnm-def`—First names in user defined font (`\bibfnamefont`)
9. EDITOR NAMES IN INCOLLECTION ETC: **a**: `nmfted`—Editors in collection like authors font
10. FONT FOR ‘AND’ IN LIST: **r**: `nmand-rm`—‘And’ in normal font (JONES and JAMES)
11. FONT OF CITATION LABELS IN TEXT: **u**: `lab,lab-def`—User defined citation font (`\citenamefont`)
12. FONT FOR ‘AND’ IN CITATIONS: **r**: `and-rm`—Cited ‘and’ in normal font
13. DATE FORMAT: *****: `yr-par`—Date in parentheses as (May 1993)
14. DATE EMPTY: **-**: `date-nil-x`—If date is empty, then do not produce the surrounding punctuation (parens, brackets, colon, comma)
15. TITLE OF ARTICLE: **d**: `tit-qq`—Title and punctuation in double quotes (“Title,” ..)
16. INPROCEEDINGS CHAPTER AND PAGES, LIKE INBOOK: **-**: `inproceedings-chapter`—produce pages after chapter, just as in InBook
17. TITLE PRESENT IN ARTICLE, INCOLLECTION, AND INPROCEEDINGS: **x**: `jt tit-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**: `jt tl-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)
% jrnlst, %: 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, brace)
% 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
% jtll-rm,%: Journal name normal font
% journal-address,%: Include address field (in parentheses) along with journal name
% book-bt,%: Field 'booktitle', or if absent field 'title', is book title
% thesis-title-o,%: Title is optional: no warning issued if empty
% trtit-b,%: Tech. report title like books
% techreport-institution-par,%: format tech report institution like book publisher
% vol-bf,%: Volume bold as {\bf vol}(num)
% vnum-x,%: Journal vol, without number as 34
% volp-com,%: Volume with comma as vol(num), ppp
% jpg-1,%: Only start page number
% book-editor-booktitle,%: Book permits empty author, produces title before editor in this case
% inbook-editor-booktitle,%: Allow using both title/booktitle, both author/editor
% bookaddress,%: Italic booktitle followed by bookaddress in roman
% num-xser,%: Allows number without series and suppresses word "number"
% number-cap,%: Capitalize word 'number' as: "Number 123"
% chapter-cap,%: Capitalize word 'chapter' as: 'Chapter 42'
% series-number,%: Series number as: 'Springer Lecture Notes No. 125'
% numser-booktitle,%: After book title and conference address, and before editors
% ser-vol,%: Series, vol. 23
% ser-rm,%: format series roman , even when used with volume
% volume-cap,%: Capitalize word 'volume', as: 'Volume 7 in Lecture Series'
% ser-ed,%: Series and volume after booktitle and before editors
% jnm-x,%: Space after journal name
% pg-bk,book-chapter-pages,%: As chapter and page: chapter 42, page 345
% pub-date,%: Publisher with address and date in parentheses (Oxford, 1994)
% ay-empty-pub-parens-x,%: eliminate parentheses altogether if nothing inside
% pre-pub,pre-edn,%: Edition, publisher, volume, chapter, pages
% isbn,%: Include ISBN for books, booklets, etc.
% issn,%: Include ISSN for periodicals
% doi-link,doi,%: Doi forms a link to the publication, anchored to the volume or title
% edby,%: In booktitle, edited by .. (where .. is names)
% blk-com,%: Comma between blocks
% fin-endsbibitem,%: Command at end instead of period
% pp,%: 'Page' abbreviated as p. or pp.
% ed,%: 'Editor' abbreviated as ed. or eds.
% abr,%: Abbreviations of such words
% ednx,%: 'Edition' abbreviated as 'ed'
% ord,%: Numerical editions as 1st, 2nd, 3rd, etc
% jabr,%: Abbreviated journal names
% etal-it,%: Italic et al
% revdata,eprint,url,url-blk,translation,%: Include REVTeX data fields collaboration, eid, eprint
% SLACcitation,%: Produce SLACcitation field
% numpages-x,%: Do not include numpages field
% url,url-prefix-x,%: URL without prefix (default: 'URL ')
% bibinfo,%: Reference component tags like \bibinfo in the content of \bibitem
% bibfield,%: Element tags like \bibfield in the content of \bibitem
% nfss,%: Use LaTeX commands which may not work with Plain TeX
%,{
% }}
%\generate{\file{apsrev4-2.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 `unsorted.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.

```
3017 \@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@cmptrs` are not bound at all.

```
3018 \appdef\setup@hook{%
3019 \bibpunct{[ ]}{,}{n}{,}{,}%
3020 }%
```

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

```
3021 \def\pre@bibdata{\jobname\bibdata@app}%
```

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

```
3022 \appdef\setup@hook{%
3023 \def\bibsection{%
3024 \par
3025 \onecolumngrid@push
3026 \begin@group
3027 \baselineskip26\p@
3028 \bib@device{\textwidth}{245.5\p@}%
3029 \end@group
3030 \nobreak\@nobreaktrue
3031 \addvspace{19\p@}%
3032 \par
3033 \onecolumngrid@pop
3034 }%
3035 }%
```

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

```
\bibpreamble 3036 \def\bib@device#1#2{%
  \bibsep 3037 \hb@xt@\z@{%
    \newblock 3038 \hb@xt@#1{%
      3039 \hfil
      3040 \phantomsection
      3041 \addcontentsline {toc}{section}{\protect\numberline{}\refname}%
      3042 % \hyper@anchorstart {\@currentHref }%
      3043 \hb@xt@#2{%
        3044 \skip@\z@\@plus-1fil\relax
        3045 \leaders\hrule height.25 \p@ depth.25 \p@ \hskip\z@\@plus1fil
        3046 \hskip\skip@
        3047 \hskip\z@\@plus0.125fil\leaders\hrule height.375\p@ depth.375\p@ \hskip\z@\@plus0.75fil
        3048 \hskip\skip@
        3049 \hskip\z@\@plus0.25 fil\leaders\hrule height.5 \p@ depth.5 \p@ \hskip\z@\@plus0.5 fil
        3050 \hskip\skip@
        3051 \hskip\z@\@plus0.375fil\leaders\hrule height.625\p@ depth.625\p@ \hskip\z@\@plus0.25fil
        3052 % \hskip\skip@
        3053 % \hfil
        3054 }%
        3055 % \hyper@anchorend
        3056 \hfil
        3057 }%
        3058 \hss
        3059 }%
```

```

3060 }%
3061 \appdef\setup@hook{%
3062 \let\bibpreamble\@empty
3063 \bibsep\z@\relax
3064 \def\newblock{\ }%
3065 }%

```

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

```

3066 \appdef\setup@hook{%
3067 \def\bibfont{%
3068 \small
3069 \@clubpenalty\clubpenalty
3070 }%
3071 }%

```

31.3.11 Index

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

```

3072 \newenvironment{theindex}{%
3073 \columnseprule \z@
3074 \columnsep 35\p@
3075 \c@secnumdepth-\maxdimen
3076 \onecolumngrid@push
3077 \section{\indexname}%
3078 \thispagestyle{plain}%
3079 \parindent\z@
3080 \parskip\z@ plus.3\p@\relax
3081 \let\item\@idxitem
3082 \onecolumngrid@pop
3083 }{%
3084 %\onecolumngrid@pop
3085 }%
3086 %
3087 \def\@idxitem{\par\hangindent 40\p@}%
3088 %
3089 \def\subitem{\par\hangindent 40\p@ \hspace*{20\p@}}%
3090 %
3091 \def\subsubitem{\par\hangindent 40\p@ \hspace*{30\p@}}%
3092 %
3093 \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.

```

3094 \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.

```
3095 \def\@pointsize@default{10}%
```

Note: the convention in REV_{TEX} 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.

```
3096 \def\rtx@apspra{%  
3097 \class@info{APS journal PRA selected}%  
3098 }%
```

31.5.2 prb

There is no code specific to prb.

```
3099 \def\rtx@apsprb{%  
3100 \class@info{APS journal PRB selected}%  
3101 }%
```

31.5.3 prc

There is no code specific to prc.

```
3102 \def\rtx@apsprc{%  
3103 \class@info{APS journal PRC selected}%  
3104 }%
```

31.5.4 prd

There is no code specific to prd.

```
3105 \def\rtx@apsprd{%  
3106 \class@info{APS journal PRD selected}%  
3107 }%
```

31.5.5 pre

There is no code specific to pre.

```
3108 \def\rtx@apspre{%
3109 \class@info{APS journal PRE selected}%
3110 }%
```

31.5.6 prl

```
3111 \def\rtx@apsprl{%
3112 \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

```
3113 \let\frontmatter@footnote@produce\frontmatter@footnote@produce@endnote
3114 \@booleanfalse\acknowledgments@sw
3115 \appdef\setup@hook{%
3116 \def\bibsection{%
3117 \par
3118 \begingroup
3119 \baselineskip26\p@
3120 \bib@device{\hsize}{72\p@}%
3121 \endgroup
3122 \nobreak\@nobreaktrue
3123 \addvspace{19\p@}%
3124 }%
3125 }%
```

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.

```
3126 \appdef\setup@hook{%
3127 \lengthcheck@sw{%
3128 \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}%
%
```

```
3129 }{ }%
3130 }%
```

A PRL does not have numbered sections.

```
3131 \c@secnumdepth=-\maxdimen
```

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

```
3132 \appdef\setup@hook{%
3133 \@ifnum{\@pointsize=10\relax}{%
3134 \lengthcheck@sw{%
3135 \def\large{%
3136 \setfontsize\large{12.5}{14\p@}%
```

```

3137 }%
3138 \def\normalsize{%
3139 \setfontsize\normalsize{10.5}\xiipt
3140 \abovedisplayskip 6\p@ \@plus6\p@ \@minus5\p@
3141 \belowdisplayskip \abovedisplayskip
3142 \abovedisplayshortskip \abovedisplayskip
3143 \belowdisplayshortskip \abovedisplayskip
3144 \let\@listi\@listI
3145 }%
3146 \def\small{%
3147 \setfontsize\small{9.5}\xiipt
3148 \abovedisplayskip 5\p@ \@plus5\p@ \@minus4\p@
3149 \belowdisplayskip \abovedisplayskip
3150 \abovedisplayshortskip \abovedisplayskip
3151 \belowdisplayshortskip \abovedisplayskip
3152 \let\@listi\@listI
3153 }%
3154 \DeclareMathSizes{12.5}{12.5}{9}{6}%
3155 \DeclareMathSizes{10.5}{10.5}{7.5}{5}%
3156 \DeclareMathSizes{9.5}{9.5}{7.0}{5}%
3157 }-%
3158 \def\normalsize{%
3159 \setfontsize\normalsize\@xpt\@xiipt
3160 \abovedisplayskip 10\p@ \@plus2\p@ \@minus5\p@
3161 \belowdisplayskip \abovedisplayskip
3162 \abovedisplayshortskip \abovedisplayskip
3163 \belowdisplayshortskip \abovedisplayskip
3164 \let\@listi\@listI
3165 }%
3166 }%
3167 }-%
3168 }%
3169 \textheight = 694.0\p@

```

End of prl code.

```

3170 }%

```

31.5.7 prper

There is no code specific to prper

```

3171 \def\rtx@apsprper{%
3172 \class@info{APS journal PRPER selected}%
3173 }%

```

31.5.8 prab

There is no code specific to prab.

```

3174 \def\rtx@apsprab{%
3175 \class@info{APS journal PRAB selected}%
3176 }%

```

31.5.9 prx

There is no code specific to prx.

```

3177 \def\rtx@apsprx{%
3178 \class@info{APS journal PRX selected}%
3179 }%

```

31.5.10 prapplied

There is no code specific to prapplied.

```

3180 \def\rtx@apsprapplied{%
3181 \class@info{APS journal PRApplied selected}%
3182 }%

```

31.5.11 prmaterials

There is no code specific to prmaterials.

```

3183 \def\rtx@apsprmaterials{%
3184 \class@info{APS journal PRMaterials selected}%
3185 }%

```

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.

```

3186 \def\rtx@apsprfluids{%
3187 \class@info{APS journal PRFluids selected}%
3188 \@booleanfalse\titlepage@sw
3189 }%

```

31.5.13 physrev

There is no code specific to physrev.

```

3190 \def\rtx@apsphysrev{%
3191 \class@info{APS unified Physical Review journal style selected}%
3192 % \begin{macrocode}
3193 }%

```

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.

```

3194 \@booleantrue\footinbib@sw

```

`\@bibdataout@init` Procedure `\@bibdataout@aps` has the job of writing the control record into `\@bibdataout@aps` 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`.

```
3195 \appdef\@bibdataout@rev{\@bibdataout@aps}%
3196 \def\@bibdataout@aps{%
3197 \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` We install code that will select the presentation for `\bibitems` and govern the `\@bibstyle` \LaTeX 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.

```

3213 \appdef\setup@hook{%
3214 \ifx{\place@bibnumber\place@bibnumber@sup}{%
3215 \footinbib@sw}{%
3216 \class@warn{Citations are superscript numbers: footnotes must be endnotes; changing to th
3217 \@booleantrue\footinbib@sw
3218 }%
3219 }{}%
3220 }%

```

Here ends the substyle for society APS.

```

3221 %</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.

```

3222 %<*rmp>

```

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

```

3223 \ifx\undefined\substyle@ext
3224 \def\@tempa{%
3225 \endinput
3226 \GenericWarning{I must be read in by REVTeX! (Bailing out)}%
3227 }%
3228 \expandafter\else
3229 \def\@tempa{}%
3230 \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.

```

3231 \ifxundefined\@journal{%

```

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

```

3232 \class@warn{Please specify the REVTeX options [aps,rmp]!}%
3233 \@@end
3234 }{}%

```

Log the journal substyle.

```

3235 \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.

```
3236 \clo@groupedaddress
```

```
\frontmatter@setup
```

```
3237 \def\frontmatter@setup{%
3238 \normalfont\sffamily\raggedright
3239 }%
```

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

```
3240 \def\PACS@warn{RMP documents do not display PACS and PACS are obsolete. Your \string\pacs\sp
```

```
\frontmatter@title@above
```

```
\frontmatter@title@format 3241 \def\frontmatter@title@above{%
\frontmatter@title@below 3242 \def\frontmatter@title@format{\Large\bfseries\raggedright}% HelveticaNeue-Medium(Italic) 14pt
3243 \def\frontmatter@title@below{\addvspace{12\p@}}% 24pt b-b down to first author
```

`\frontmatter@authorformat` Set the rag to a milder value, because we want to do true ragged right typesetting, as opposed to the L^AT_EX default, which gives very poor results.

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

```
3244 \def\frontmatter@authorformat{%
3245 \preprintsty@sw{\vskip0.5pc\relax}{}%
3246 \@tempskipa\@flushglue
3247 \@flushglue\z@ plus.8\hsize
3248 \raggedright\advance\leftskip.5in\relax
3249 \@flushglue\@tempskipa
3250 \parskip\z@skip
3251 \@totalleftmargin\leftskip
3252 }%
```

`\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

```
3253 \def\frontmatter@affiliationfont{% Helvetica 9/10.2
3254 \small\slshape\selectfont\baselineskip10.5\p@\relax
3255 \@tempskipa\@flushglue
3256 \@flushglue\z@ plus.8\hsize
3257 \raggedright\advance\leftskip.5in\relax
3258 \@flushglue\@tempskipa
3259 \@totalleftmargin\leftskip
3260 \let\def@after@address\def@after@address@empty
3261 }%
```

```
3262 \def\frontmatter@above@affilgroup{\addvspace{7.2\p@}}% additional leading above an author
3263 \def\frontmatter@above@affiliation{\addvspace{5.3\p@}}%
3264 \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 substytle, and any document class option bearing on same will in turn override.

3265 \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.

3266 \def\frontmatter@RRAP@format{%

3267 \addvspace{7.3\p@}%

3268 \small

3269 \raggedright\advance\leftskip.5in\relax

3270 \@totalleftmargin\leftskip

3271 }%

3272 \def\produce@RRAP#1{%

3273 \@ifempty{#1}{-}{%

3274 \@ifvmode{\leavevmode}{-}{%

3275 \unskip(\ignorespaces#1\unskip)\quad

3276 }%

3277 }%

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

3278 \def\frontmatter@abstractheading{%

3279 \preprintsty@sw{%

3280 \beginngroup

3281 \centering\large

3282 \abstractname

3283 \par

3284 \endgroup

3285 \vspace{.5pc}%

3286 }-}{%

3287 }%

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

3288 \def\frontmatter@abstractfont{%

3289 \footnotesize

3290 \hsize360\p@

3291 \leftskip=0.5in

3292 \parindent\z@

3293 \@totalleftmargin\leftskip

3294 }%

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

\frontmatter@postabstractspace base-to-base.

3295 \def\frontmatter@preabstractspace{7.7\p@}%

3296 \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.

```
3297 \appdef\setup@hook{%
3298 \preprintsty@sw}{-%
3299 \def\normalsize{%
3300 \@setsize\normalsize{12pt}\xpt\xpt
3301 \abovedisplayskip 10\p@ plus2\p@ minus5\p@
3302 \belowdisplayskip \abovedisplayskip
3303 \abovedisplaysshortskip \abovedisplayskip
3304 \belowdisplaysshortskip \abovedisplayskip
3305 \let\@listi\@listI
3306 }%
3307 }%
3308 }%
```

Footnote mods:

```
3309 \footnotesep 9.25pt
3310 \skip\footins 36pt plus 4pt minus 12pt
3311 \def\footnoterule{%
3312 \dimen@\skip\footins\divide\dimen@\thr@@
3313 \kern-\dimen@\hrule width.5in\kern\dimen@
3314 }%
```

33.2 Sectioning

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

```
3315 \def\secnums@rtx{%
3316 \@ifundefined\thepart{%
3317 \def\thepart{\Roman{part}}}%
3318 }{}%
3319 \@ifundefined\thesection{%
3320 \def\thesection {\Roman{section}}}%
3321 \def\p@section {}%
3322 }{}%
3323 \@ifundefined\thesubsection{%
3324 \def\thesubsection {\Alph{subsection}}}%
3325 \def\p@subsection {\thesection.}%
3326 }{}%
3327 \@ifundefined\thesubsubsection{%
3328 \def\thesubsubsection {\arabic{subsubsection}}}%
3329 \def\p@subsubsection {\thesection.\thesubsection.}%
3330 }{}%
3331 \@ifundefined\theparagraph{%
3332 \def\theparagraph {\alph{paragraph}}}%
3333 \def\p@paragraph {\thesection.\thesubsection.\thesubsubsection.}%
3334 }{}%
```

```

3335 \ifxundefined\thesubparagraph{%
3336 \def\thesubparagraph {\arabic{subparagraph}}}%
3337 \def\p@subparagraph {\thesection.\thesubsection.\thesubsubsection.\theparagraph.}%
3338 }{}%
3339 }%

```

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

```

3340 \def\@secntformat#1{\csname the#1\endcsname.\hskip0.5em\relax}%

```

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

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

```

3341 \def\section{%
3342 \@startsection{section}{1}{\z@}{0.8cm plus1ex minus.2ex}{0.4cm}%
3343 {%
3344 \small\sffamily\bfseries\selectfont
3345 \raggedright
3346 \parindent\z@
3347 }%
3348 }%
3349 \def\@hangfrom@section#1#2#3{\@hangfrom{#1#2}\MakeTextUppercase{#3}}%
3350 \def\@hangfroms@section#1#2{#1\MakeTextUppercase{#2}}%
3351 \def\subsection{%
3352 \@startsection{subsection}{2}{\z@}{0.8cm plus1ex minus.2ex}{0.4cm}%
3353 {%
3354 \small\sffamily\bfseries
3355 \raggedright
3356 \parindent\z@
3357 }%
3358 }%
3359 \def\subsubsection{%
3360 \@startsection{subsubsection}{3}{\z@}{.8cm plus1ex minus.2ex}{0.4cm}%
3361 {%
3362 \small\sffamily\selectfont
3363 \raggedright
3364 \parindent\z@
3365 }%
3366 }%
3367 \def\paragraph{%
3368 \@startsection{paragraph}{4}{\z@}{.8cm plus1ex minus.2ex}{-1em}%
3369 {%
3370 \small\slshape\selectfont
3371 \raggedright
3372 \parindent\z@
3373 }%
3374 }%
3375 \def\subparagraph{%
3376 \@startsection{subparagraph}{4}{\parindent}{3.25ex plus1ex minus.2ex}{-1em}%
3377 {\normalsize\bfseries\selectfont}%
3378 }%

```

```
3379 %
3380 \setcounter{tocdepth}{4}% FIXME: has no effect
```

```
\appendix
\@hangfrom@appendix 3381 \appdef\appendix{%
\@hangfroms@appendix 3382 \let\@hangfrom@section\@hangfrom@appendix
\@appendixcntformat 3383 \let\@sectioncntformat\@appendixcntformat
3384 }%
3385 \def\@hangfrom@appendix#1#2#3{%
3386 #1%
3387 \@ifempty{#2}{%
3388 #3%
3389 }{%
3390 #2\@ifempty{#3}{\ #3}%
3391 }%
3392 }%
3393 \def\@hangfroms@appendix#1#2{%
3394 #1\appendixname\@ifempty{#2}{\ #2}%
3395 }%
3396 \def\@appendixcntformat#1{\appendixname\ \csname the#1\endcsname}%
```

33.3 Figure and Table Caption Formatting

```
\@makecaption
3397 \setlength\belowcaptionskip{2\p@}
3398 \long\def\@makecaption#1#2{%
3399 \vskip\abovecaptionskip
3400 \vbox{%
3401 \flushing
3402 \small\rmfamily
3403 \noindent
3404 #1\@caption@fignum@sep#2\par
3405 }%
3406 \vskip\belowcaptionskip
3407 }%
3408 \def\@caption@fignum@sep{\nobreak\hskip.5em plus.2em\ignorespaces}%
```

33.4 Citations and Bibliography

Customize REV_TE_X for the journal substyle; this task requires three components: a BIB_TE_X .bst style file, customizing code for natbib, and customizations of the thebibliography environment.

`\@bibstyle` Define the argument of the `\bibliographystyle` command (if the document does not do so).

The user must have installed a .bst file of the corresponding name. This file will then be used by BIB_TE_X 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 : *: **jnr1st**—Junior comes last as Smith, John, Jr.
8. TYPEFACE FOR AUTHORS IN LIST OF REFERENCES: **u**: **nmft,nmft-def**—User defined author font (`\bibnamefont`)
9. FONT FOR FIRST NAMES : **u**: **fnm-def**—First names in user defined font (`\bibfnamefont`)
10. EDITOR NAMES IN INCOLLECTION ETC: **a**: **nmfted**—Editors in collection like authors font
11. FONT FOR ‘AND’ IN LIST: **r**: **nmand-rm**—‘And’ in normal font (JONES and JAMES)
12. FONT OF CITATION LABELS IN TEXT : **u**: **lab,lab-def**—User defined citation font (`\citenamefont`)
13. FONT FOR ‘AND’ IN CITATIONS : **r**: **and-rm**—Cited ‘and’ in normal font
14. 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**: **jt看-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, braces)
%  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
% jttil-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.

```
3409 \def\@bibstyle{apsrmp\substyle@post}%
```

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

```
3410 \@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.

```
3411 \def\@bibdataout@aps{%
3412 \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.

```
3413 @CONTROL{%
3414   apsrmp41Control%
```

Say whether we want long bibliography style (the default), or the abbreviated style.

```
3415   \longbibliography@sw{%
3416     ,author="03",editor="0",pages="1",title="0",year="0"%
3417   }{%
3418     ,author="0B",editor="0",pages="0",title="0",year="1"% TeXSupport
3419   }%
3420 }%
3421 }%
```

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

```
3422 \if@filesw
3423 \immediate\write\@auxout{\string\citation{apsrmp41Control}}%
3424 \fi
3425 }%
```

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

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

`\bibhang` Per Karie Friedman (`friedman@phys.washington.edu`), multiple citations are separated by semicolons, e.g., (Jones, 1999; Abbott and Smith, 2000; Wortley, 2001a), and multiple citations by the same author by commas, e.g., Abela et al. (1995, 1997a, 1997b). The third argument of `\bibpunct` handles the former.

The fifth argument puts a comma after the author when the year is not in parens: (Lee et al., 1996).

Incidentally, this `\bibpunct` command specifies the `natbib` default values.

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

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

```
3426 \appdef\setup@hook{%
```

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

```
3427 \bibpunct{(%)
3428 }{%(
3429 )}{;}{a}{f}{f}{,}%
```

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

```
3430 \def\bibsection{%
3431 \expandafter\section\expandafter*\expandafter{\refname}%
3432 \@nobreaktrue
3433 }%
3434 \let\bibpreamble\@empty
3435 \def\newblock{\ }%
3436 \bibhang10\p@
3437 \bibsep\z@
```

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

```
3438 \let\cite\citep
```

End of code to be delayed until after `natbib` loads.

```
3439 }%
```

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

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

```
3440 \@booleanfalse\footinbib@sw
3441 \appdef\setup@hook{%
3442 \footinbib@sw{%
3443 \class@warn{%
3444 Footnotes in bibliography are incompatible with RMP.^J%
3445 Undoing the footinbib option.
3446 }%
3447 \@booleanfalse\footinbib@sw
3448 }{}%
3449 \@ifnum{\NAT@merge>\@ne}{\let\NAT@merge\@ne}{}%
3450 \def\NAT@cmprs{\z@}%
3451 }%
```

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

```
3452 \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.

```
3453 \def\toc@font{%
3454 \footnotesize\rmfamily
3455 \def\{\space\ignorespaces}%
3456 }%
3457 \def\ltxu@dotsep{5.5pt}%
```

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

```
3458 \def\tocleft@{\z@}%
3459 \def\tocdim@min{5\p@}%
3460 \def\l@section{%
3461 \l@sections@{section}% Implicit #3#4
3462 }%
3463 \def\l@subsection{%
3464 \l@sections@{section}{subsection}% Implicit #3#4
3465 }%
3466 \def\l@subsubsection{%
3467 \l@sections@{subsection}{subsubsection}% Implicit #3#4
3468 }%
3469 %\def\l@subsubsection#1#2{%
3470 \def\l@paragraph#1#2{%
3471 \def\l@subparagraph#1#2{%
```

Activate the TOC processing.

```
3472 \let\toc@pre\toc@pre@auto
3473 \let\toc@post\toc@post@auto
3474 %</rmp>
```

Here ends the programmer's documentation.

Change History

4.0a		print homepage	5, 17
General: 4.0d had twoside option		protect against hyperref revtex	
setting twoside switch to false	5	kludges which are not needed	
comma not space between email		now	5, 17
and homepage	5	Rearrange the ordering so	
Initial version	5	numerical ones come first. AO:	
Move after process options, so		David, what does this mean?	5
<code>\clearpage</code> not in scope of		single space footnotes	5, 47
<code>twocolumn</code>	5	use font-dependent spacing	5
Move after process options, so		<code>\lastpage@putlabel</code> : Move after	
the following test works	5	process options, so <code>\clearpage</code>	
multiple preprint commands	5	not in scope of <code>twocolumn</code>	33

<code>\openone</code> : use font-dependent spacing	76	overridden by “simple” options.	5, 17
<code>\preprintsty@sw</code> : comma not space between email and homepage	16	New option	5
Rearrange the ordering so numerical ones come first. AO: David, what does this mean?	16	One-line caption sets flush left.	5
<code>\ps@preprint</code> : Move after process options, so the following test works	32	only execute if appropriate	5
<code>\ps@titlepage</code> : multiple preprint commands	94	Processing delayed to <code>\AtBeginDocument</code> time	5, 41, 43
<code>\twoside@sw</code> : 4.d had twoside option setting twoside switch to false	20	Removed invocation of nonexistent class option <code>groupauthors</code> and all other class options that should only be invoked by the document. (Otherwise precedence of class options does not work.)	5, 31
4.0b		Restore all media size class option of <code>_classes.dtx</code>	5
General: Added localization of <code>\figuresname</code>	5	Stack <code>\preprint</code> args flush right at right margin.	5
Added localization of <code>\tablename</code>	5	<code>\@makecaption</code> : One-line caption sets flush left.	41
AO: all code for 10pt is in this module.	5, 79	<code>\figurename</code> : Added localization of <code>\figuresname</code>	68
AO: all code for 11pt is in this module.	5, 82	<code>\paperwidth</code> : Restore all media size class option of <code>_classes.dtx</code>	17
AO: all code for 12pt is in this module.	5, 83	<code>\preprintsty@sw</code> : Move this “complex” option to the front, where it can be overridden by “simple” options.	16
AO: made <code>aps.rtx</code> part of <code>revtex4.dtx</code>	5, 87	<code>\printfigures</code> : call <code>\print@floats</code>	43
AO: remove duplicates	5	<code>\printtables</code> : only execute if appropriate	45
call <code>\print@floats</code>	5	<code>\ps@preprint</code> : Defer decision until <code>\AtBeginDocument</code> time	32
Defer assignment until <code>\AtBeginDocument</code> time.	5, 63	<code>\ps@titlepage</code> : Stack <code>\preprint</code> args flush right at right margin.	94
Defer decision until <code>\AtBeginDocument</code> time	5	<code>\roarrow</code> : AO: remove duplicates	77
Define three separate environments, defer assignment to <code>\AtBeginDocument</code> time.	5, 65	<code>\showKEYS@sw</code> : New option	16
First modifications by Arthur Ogawa (mailto:arthur_ogawa at sbcglobal dot net)	5	<code>\tablename</code> : Added localization of <code>\tablename</code>	68
Frank Mittelbach, has stated in <code>multicol</code> : “The kernel command <code>\@footnotetext</code> should not be modified.” Thus, I have removed David Carlisle’s redefinition of that command. Note, however, that later versions of <code>multicol</code> do not require this workaround. Belt and suspenders.	5, 47	4.0c	
Move this “complex” option to the front, where it can be		General: (AO, 115) If three or more preprints specified, set on single line, with commas.	5
		(AO, 129) section* within appendix was producing appendixname	5
		*-form mandates pagebreak	5
		also spelled “acknowledgements”.	5, 38
		Do not put by REVTeX in every page foot	5
		grid changes via <code>ltxgrid</code> procedures	5

grid changes with ltxgrid	5, 65, 107	<code>\preprint@sw</code> : New option	17
Insert procedure <code>\checkindate</code>	5	<code>\printtables</code> : make longtable	
Lose compatability mode.	5, 13	trigger the head, too	45
New ltxgrid-based code, other		<code>\url</code> : eprint takes an optional	
bug fixes	5	argument, syntactical only in	
New option “checkin”	5, 15	this case.	71
Prevent an inner footnote from		4.0e	
performing twice	5	General: adornments above and	
<code>\@appendixcntformat</code> : (AO, 129)		below.	5
section* within appendix was		Bug fixes and minor new	
producing appendixname	99	features: title block affiliations	
<code>\@makecaption</code> : Prevent an inner		can have ancillary data, just	
footnote from performing twice	41	like authors; clearpage	
<code>\close@column@grid</code> : grid changes		processing revamped, with	
with ltxgrid	66	floats staying in order;	
<code>\frontmatter@abstractfont</code> :		widetext ornaments.	5
(AO, 123) add parskip to the		New option showkeys	5
abstract.	90	<code>\showKEYS@sw</code> : New option	
<code>\open@column@two</code> : Grid changes		showkeys	16
with ltxgrid	64	<code>widetext@grid</code> : adornments above	
<code>\printfigures</code> : *-form mandates		and below.	66
pagebreak	43	4.0f	
<code>\printtables</code> : *-form mandates		General: Last bug fixes before	
pagebreak	45	release.	5
<code>\produce@preprints</code> : (AO, 115) If		4.0rc1	
three or more preprints		General: grid changes with push	
specified, set on single line,		and pop	5, 107
with commas.	94	Running headers always as if	
<code>\ps@preprint</code> : Do not put by		two-sided	5
REVTeX in every page foot	33	<code>\bibsection</code> : grid changes with	
Insert procedure		push and pop	106
<code>\checkindate</code>	32, 33	<code>\ps@preprint</code> : Running headers	
<code>\ps@titlepage</code> : Insert procedure		always as if two-sided	32
<code>\checkindate</code>	94	4.0rc4	
<code>widetext@grid</code> : grid changes via		General: hyperref is no longer	
ltxgrid procedures	66	loaded via class option: use a	
4.0d		usepackage statement	
General: Also alter how lists get		instead	5, 17
indented.	5	4.1a	
But alternative spelling is		General: (AO, 451) “Cannot have	
deprecated.	5, 38	more than 256 cites in a	
eprint takes an optional		document”	5
argument, syntactical only in		(AO, 457) Endnotes to be sorted	
this case.	5	in with numerical citations.	5
make longtable trigger the head,		(AO, 460) “Proper style is	
too	5	”FIG. 1. ...” (no colon)”	5
More features and bug fixes:		(AO, 461) Change the csname	
compatability with longtable		revtex uses from @dotsep to	
and array packages. Now		ltxu@dotsep. The former is	
certainly incompatible with		understood in mu. (What we	
multicol.	5	wanted was a dimension.)	5, 97
New option	5	(AO, 478) <code>\ds@letterpaper</code> , so	
<code>\open@column@two</code> : Also alter how		that “letterpaper really is the	
lists get indented.	64	default”	5

(AO, 488) Change processing of options to allow an unused option to specify society and journal	5, 29	(AO) Structure the Abstract using the <code>bibliography</code> environment	5, 36
For natbib versions before 8.21, <code>\NAT@sort</code> was consulted only as natbib was being read in. Now it is fully dynamic.	5	(AO) coordinate <code>\if@twoside</code> with <code>\twoside@sw</code>	5
<code>\@endnotesinbibliography:</code> (AO, 457) Endnotes to be sorted in with numerical citations.	60	(AO) make settings at class time instead of deferring them to later.	5, 17, 115, 116
<code>\@endnotetext:</code> (AO, 457) Endnotes to be sorted in with numerical citations.	58	(AO) provide option <code>longbibliography</code>	5, 19
<code>\@makecaption:</code> (AO, 460) “Proper style is ”FIG. 1. ...” (no colon)”	41	(AO, 455) Be nice to a list within the abstract (assign <code>\@totalleftmargin</code>).	5
<code>\@xendnote:</code> (AO, 457) Endnotes to be sorted in with numerical citations.	57	Add <code>\@changefroms@section</code>	5, 117
<code>\@authoryear@sw:</code> (AO, 457) Endnotes to be sorted in with numerical citations.	21, 105, 124	Add option <code>reprint</code> , opposite of <code>preprint</code> , and preferred alternative to <code>twocolumn</code>	5
<code>\bibliography:</code> (AO, 457) Endnotes to be sorted in with numerical citations.	53	As with author formatting, rag the right more, and assign <code>\@totalleftmargin</code> . Also neutralize <code>\def@after@address</code>	5
<code>\bibpunct:</code> For natbib versions before 8.21, <code>\NAT@sort</code> was consulted only as natbib was being read in. Now it is fully dynamic.	106	Break out <code>\@caption@fignum@sep</code>	5
<code>\paperwidth:</code> (AO, 478) <code>\ds@letterpaper</code> , so that “letterpaper really is the default”	18	Class option <code>galley</code> sets <code>\preprintsty@sw</code> to false	5
<code>\toc@font:</code> (AO, 461) Change the <code>csname</code> <code>revtex</code> uses from <code>@dotsep</code> to <code>ltxu@dotsep</code> . The former is understood in mu. (What we wanted was a dimension.)	126	Code relating to new syntax for <code>frontmatter</code> has been placed in <code>ltxfront.dtx</code>	5, 27
4.1b		Package <code>textcase</code> is now simply a required package	5
General: (AO) Implement bibnotes through <code>\frontmatter@footnote@produce</code> instead of <code>\bibnotes@sw</code>	5	Procedures <code>\@parse@class@options@society</code> and <code>\@parse@class@options@journal</code> and friends	5
(AO) No longer need to test <code>\chapter</code> as of natbib version 8.2	5, 57	Rag the right even more: <code>.8\hsize</code> . Also, assign <code>\@totalleftmargin</code>	5
(AO) No longer use <code>\secnumarabic@sw</code> , instead use <code>\setup@secnums</code>	5, 23	Read in all required packages together	5
(AO) Provide more diagnostics when <code>\@society</code> is assigned.	5	Remove options <code>newabstract</code> and <code>oldabstract</code>	5, 28
		Section numbering via procedures <code>\secnums@rtx</code> and <code>\secnums@arabic</code>	5, 116
		The <code>rmp</code> journal substyle selects <code>groupedaddress</code> by default.	5, 115
		The <code>csname</code> <code>substyle@ext</code> is now defined without a dot (<code>.</code>), to be compatible with L ^A T _E X usage (see <code>@clsextension</code> and <code>@pkgextension</code>).	5, 30

Use <code>\setup@hook</code> to initialize all.	5, 116	Rag the right even more: .8\hsize. Also, assign <code>\@totalleftmargin</code>	114
<code>\@appendixcntformat</code> : Add <code>\@hangfrom@section</code>	118	<code>\frontmatter@footnote@produce</code> : (AO) Implement bibnotes through <code>\frontmatter@footnote@produce</code> instead of <code>\bibnotes@sw</code>	18
<code>\@makecaption</code> : Break out <code>\@caption@fignum@sep</code>	118	<code>\frontmatter@RRAP@format</code> : (AO, 455) Be nice to a list within the abstract (assign <code>\@totalleftmargin</code>).	115
<code>\@parse@class@options@</code> : Procedures <code>\@parse@class@options@society</code> and <code>\@parse@class@options@journal</code> and friends	29	<code>\frontmatterverbose@sw</code> : Code relating to new syntax for frontmatter has been placed in □ <code>ltxfront.dtx</code>	28
<code>\altaffilletter@sw</code> : (AO) make settings at class time instead of deferring them to later.	19	<code>\galley@sw</code> : Class option galley sets <code>\preprintsty@sw</code> to false	21
<code>\balance@lastpage@sw</code> : (AO) make settings at class time instead of deferring them to later.	16	<code>\lengthcheck@sw</code> : (AO) make settings at class time instead of deferring them to later.	22
<code>\byrevtex@sw</code> : (AO) make settings at class time instead of deferring them to later.	27	<code>\MakeLowercase</code> : Package textcase is now simply a required package	25
<code>\change@journal</code> : (AO) Provide more diagnostics when <code>\@society</code> is assigned.	24	Read in all required packages together	25
<code>\draft@sw</code> : (AO) make settings at class time instead of deferring them to later.	22	amsfonts : Read in all required packages together	25
<code>\floatp@sw</code> : (AO) make settings at class time instead of deferring them to later.	23	amsmath : Read in all required packages together	26
<code>\footinbib@sw</code> : (AO) make settings at class time instead of deferring them to later.	19	amssymb : Read in all required packages together	25
<code>\force@deferlist@sw</code> : (AO) make settings at class time instead of deferring them to later.	27	<code>\place@bibnumber</code> : (AO) make settings at class time instead of deferring them to later.	19
<code>\frontmatter@abstractfont</code> : (AO, 455) Be nice to a list within the abstract (assign <code>\@totalleftmargin</code>).	115	<code>\preprint@sw</code> : (AO) make settings at class time instead of deferring them to later.	17
<code>\frontmatter@affiliationfont</code> : (AO, 455) Be nice to a list within the abstract (assign <code>\@totalleftmargin</code>).	114	<code>\preprintsty@sw</code> : Add option reprint, opposite of preprint, and preferred alternative to <code>twocolumn</code>	16
As with author formatting, rag the right more, and assign <code>\@totalleftmargin</code> . Also neutralize <code>\def@after@address</code>	114	<code>\raggedcolumn@sw</code> : (AO) make settings at class time instead of deferring them to later.	22
<code>\frontmatter@authorformat</code> : (AO, 455) Be nice to a list within the abstract (assign <code>\@totalleftmargin</code>).	114	<code>\revsymb@inithook</code> : (AO) make settings at class time instead of deferring them to later.	78
		<code>\rxt@require@packages</code> : Read in all required packages together	25
		<code>\tightenlines@sw</code> : (AO) make settings at class time instead of deferring them to later.	22

<code>\titlepage@sw:</code> (AO) make settings at class time instead of deferring them to later.	24	<code>\@fnsymbol:</code> (AO, 530) <code>\@fnsymbol:</code> Failed to import fixltx2e.sty technology. Return to LaTeX core.	89
<code>\twocolumn@sw:</code> (AO) make settings at class time instead of deferring them to later.	20	<code>\footinbib@sw:</code> (AO, 523) Add class option nomerge, to turn off new natbib 8.3 syntax . . .	125
<code>\twoside@sw:</code> (AO) coordinate <code>\if@twoside</code> with <code>\twoside@sw</code>	20	<code>\linenumbers@sw:</code> (AO, 513) Add class option linenumbers: number the lines a la <code>lineno</code> .	28
4.1c General: Document class option <code>longbibliography</code> via <code>\substyle@post</code>	5	<code>\NAT@merge:</code> (AO, 523) Add class option nomerge, to turn off new natbib 8.3 syntax	29
<code>\@bibstyle:</code> Document class option <code>longbibliography</code> via <code>\substyle@post</code>	124	<code>\notesname:</code> (AO, 520) Automatically produce <code>\bibliography</code> command when needed	68
4.1d General: Definition of <code>\@fnsymbol</code> follows fixltx2e.sty	5	<code>\present@bibnote:</code> (AO, 521) Lonely bibliography head . . .	54
<code>\@fnsymbol:</code> Definition of <code>\@fnsymbol</code> follows fixltx2e.sty	89	<code>\printendnotes:</code> (AO, 520) Automatically produce <code>\bibliography</code> command when needed	60
4.1e General: (AO, 455) be nice to a list within the abstract	5	<code>\thebibliography@nogroup:</code> (AO, 520) Automatically produce <code>\bibliography</code> command when needed	61
<code>\frontmatter@abstractfont:</code> (AO, 455) be nice to a list within the abstract	90	4.1g General: (AO, 525) Remove phantom paragraph above display math that is given in vertical mode	5
4.1f General: (AO, 513) Add class option <code>linenumbers: number</code> the lines a la <code>lineno</code>	5	(AO, 538) <code>\MakeTextUppercase</code> inappropriately expands the double backslash	5
(AO, 516) Merged references are separated with a semicolon	5, 53	<code>\MakeLowercase:</code> (AO, 538) <code>\MakeTextUppercase</code> inappropriately expands the double backslash	25
(AO, 520) Automatically produce <code>\bibliography</code> command when needed	5	<code>widetext@grid:</code> (AO, 525) Remove phantom paragraph above display math that is given in vertical mode	66
(AO, 521) Lonely bibliography head	5	4.1h General: (AO) Remove expiry code in the release software	5, 75
(AO, 522) Warn if software is expired	5, 75	4.1i General: (AO, 541) Defer assignment of <code>\cite</code> until after natbib loads	5
(AO, 523) Add class option <code>nomerge</code> , to turn off new natbib 8.3 syntax	5	<code>\cite:</code> (AO, 541) Defer assignment of <code>\cite</code> until after natbib loads	125
(AO, 524) Makes no sense if citations are superscript numbers and so are footnotes	5, 112		
(AO, 530) <code>\@fnsymbol:</code> Failed to import fixltx2e.sty technology. Return to LaTeX core.	5		
<code>\@endnotesinbibliography:</code> (AO, 520) Automatically produce <code>\bibliography</code> command when needed	60, 61		

4.1j	General: (AO, 545) hypertext capabilities off by default; enable with <code>hypertext</code> . . . 5, 30	(AO, 572) Independent footnote counter for title block. Abstract footnote counter shared with body. 5
	(AO, 549) Repairing natbib's <code>\BibitemShut</code> and <code>\bibAnnote</code> 5	(AO, 572) <code>\@makefnstext</code> and <code>\frontmatter@makefnstext</code> must be defined harmoniously 5, 98
	(AO, 551) Punctuation at end of reference when optional arguments to the cite key are given. 52	(AO, 573) arrange to load <code>lineno</code> after any other packages. 5
	(AO, 552) Repair spacing in <code>\onlinecite</code> 5	(AO, 575) the default for journal <code>prstper</code> is <code>longbibliography</code> . . . 5
	<code>\bibAnnote</code> : (AO, 549) Repairing natbib's <code>\BibitemShut</code> and <code>\bibAnnote</code> 51	(AO, 576) In .bst files, remove support for the <code>annote</code> field 5, 99
	<code>\rtx@def@citea@box</code> : (AO, 552) Repair spacing in <code>\onlinecite</code> 50	<code>\clear@document</code> : (AO, 569) Use of <code>hyperref</code> interferes with column balancing of last page 21
4.1k	General: (AO, 554) give the <code>\newlabel</code> command syntax appropriate to the <code>hyperref</code> package 5	<code>\frontmatter@makefnstext</code> : (AO, 572) Independent footnote counter for title block. Abstract footnote counter shared with body. 99
	(AO, 561) remove dead code relating to <code>\bibitemContinue</code> 53	<code>\lastpage@putlabel</code> : (AO, 569) execute the after-last-shipout procedures from within the safety of the output routine . . 33
	<code>\lastpage@putlabel</code> : (AO, 554) give the <code>\newlabel</code> command syntax appropriate to the <code>hyperref</code> package 33	<code>\linenumbers@sw</code> : (AO, 573) arrange to load <code>lineno</code> after any other packages. 28
4.1n	General: (AO) fine-tune spacing above and below <code>widertext</code> 5	<code>\preprint@sw</code> : (AO, 565) restore 4.0 behavior: default value of <code>\preprint@sw</code> follows <code>\preprintsty@sw</code> 17
	(AO, 565) restore 4.0 behavior: invoking class option <code>preprint</code> implies class option <code>preprintnumbers</code> 5	<code>\present@bibnote</code> : (AO, 572) Independent footnote counter for title block. Abstract footnote counter shared with body. 54
	(AO, 566) restore 4.0 behavior: flush column bottoms 5, 98	<code>\save@note</code> : (AO, 572) Independent footnote counter for title block. Abstract footnote counter shared with body. 57
	(AO, 569) Use of <code>hyperref</code> interferes with column balancing of last page 5	<code>\thebibliography@nogroup</code> : (AO, 572) Independent footnote counter for title block. Abstract footnote counter shared with body. 61
	(AO, 569) execute the after-last-shipout procedures from within the safety of the output routine 5	<code>widertext@grid</code> : (AO) fine-tune spacing above and below <code>widertext</code> 66
	(AO, 571) Interface <code>\set@footnotewidth</code> for determining the set width of footnotes 5	
	(AO, 571) class file must set <code>\splittopskip</code> ; fine tune <code>\skip\footins</code> ; <code>\footnoterule</code> defined in terms of <code>\skip\footins</code> 5, 80, 81, 85, 86, 116	4.1o General: (AO, 549) Remove patch

to natbib, which is now at version 8.31a	5	interface to <code>ltxgrid</code>	
(AO, 575) Automatically incorporate the (Bib \TeX -generated) .bbl into an explicit <code>thebibliography</code> . .	5	<code>\onecolumn@grid@setup</code> and <code>\twocolumn@grid@setup</code>	5
(AO, 578) accommodate the possible space character preceding <code>\BibitemShut</code> . . .	5, 53	(AO, 584) Per MD, remove trailing space character from each journal abbreviation: it had caused an extraneous space in the .bbl	5, 88
(AO, 579) Endnote shall comprise their own Bib \TeX entry type: <code>@FOOTNOTE</code>	5	<code>\twocolumn@sw</code> : (AO, 583) Provide interface to <code>ltxgrid</code> <code>\onecolumn@grid@setup</code> and <code>\twocolumn@grid@setup</code>	20
(AO, 580) Control .bst at run time.	5	4.1q General: (AO, 586) When .bbl is pasted into the document, prevent automatic bibliography inclusion.	5
(AO, 580) Provide a document class option to turn off production of eprint field in bibliography.	5	(AO, 588) Only write REV \TeX -specific Bib \TeX .bib data if the .bst style is set by REV \TeX	5
(AO, 581) Handle case: merged references, with first ending in a stop character.	5, 53	<code>\@bibdataout@aps</code> : (AO, 588) Only write REV \TeX -specific Bib \TeX .bib data if the .bst style is set by REV \TeX	60
<code>\@bibdataout@aps</code> : (AO, 580) Control .bst at run time. . . .	60, 111	<code>\bibliographystyle</code> : (AO, 586) When .bbl is pasted into the document, prevent automatic bibliography inclusion.	52
(AO, 580) Provide a document class option to turn off production of eprint field in bibliography.	60	(AO, 588) Only write REV \TeX -specific Bib \TeX .bib data if the .bst style is set by REV \TeX	52
<code>\@bibdataout@rmp</code> : (AO, 580) Control .bst at run time. . . .	124	<code>\present@bibnote</code> : (AO, 586) When .bbl is pasted into the document, prevent automatic bibliography inclusion.	54
<code>\@endnotetext</code> : (AO, 579) Endnote shall comprise their own Bib \TeX entry type: <code>@FOOTNOTE</code>	59	<code>write@bibliographystyle</code> : (AO, 588) Only write REV \TeX -specific Bib \TeX .bib data if the .bst style is set by REV \TeX	55
<code>\bibAnnote</code> : (AO, 549) Remove patch to natbib, which is now at version 8.31a	51	4.1r General: (AO, 595) Provide <code>\lovname</code> along with other List of Videos definitions.	5, 45
(AO, 578) accommodate the possible space character preceding <code>\BibitemShut</code>	51	4.2a General: (Aptara) Corrected indentation for tableofcontents appearing along with listoffigure/listoftable.	5
<code>\eprint@enable@sw</code> : (AO, 580) Provide a document class option to turn off production of eprint field in bibliography. . .	20	(Aptara) Make prb style to follow other Phys. Rev. journals.	5
<code>\present@bibnote</code> : (AO, 575) Automatically incorporate the (Bib \TeX -generated) .bbl into an explicit <code>thebibliography</code> .	54		
<code>\thebibliography@nogroup</code> : (AO, 575) Automatically incorporate the (Bib \TeX -generated) .bbl into an explicit <code>thebibliography</code>	61		
4.1p General: (AO, 583) Provide			

(Aptara, MD) Added initial support for SOR and AAPM journals, additional journals for APS, and additional journals and proceedings for AIP, unreleased.	5	display of e-print ids in bibliography.	5
(MD) Add call to normalsize to be a good citizen and allow booktabs.sty to work properly .	5	(MD) MD - not sure why these parameters were different previously. Made them match except for title.	5
(MD) Make long bibliography style the default now.	5	(MD) Make titles in bibliography default, prb style to follow other Phys. Rev. journals, add a unified physrev option as well as prx and prapplied options. Corrected indentation for tableofcontents appearing along with listoffigure/listoftable.	5
(MD, Aptara) Make titles in bibliography default, prb style to follow other Phys. Rev. journals, add a unified physrev option as well as prx, prapplied, prmaterials, prfluids, prab, and prper options. Corrected indentation for tableofcontents appearing along with listoffigure/listoftable.	71	(MD) PACS are obsolete altogether now	5
<code>\longbibliography@sw:</code> (MD) Make long bibliography style the default now.	19	(MD) Update options for new titles without "Special Topics" and make prper match style of other journal options	5
<code>\setup@hook:</code> (MD) Add call to to be a good citizen and allow booktabs.sty to work properly	75	<code>\@bibdataout@aps:</code> (MD) Improve control over display of e-print ids in bibliography.	60
4.2b		(MD) MD - not sure why these parameters were different previously. Made them match except for title.	112
General: (MD) Add options for new APS journals and a generic physrev option for future-proofing	5	<code>\PACS@warn:</code> (MD) PACS are obsolete altogether now . .	114
(MD) Change default to not use a title page - it seems antiquated	5, 91	4.2f	
(MD) Improve control over		<code>\@fnsymbol:</code> (PHO)	
		<code>\@fnsymbol:</code> Correct	
		<code>\ifcase</code> nesting logic.	89

Index

- Symbols**
- \(..... 1568
 - \) 1568
 - \, 874, 878, 882, 886
 - .aux 12, 33, 55
 - .bb1 99, 118
 - .bst 99, 118
 - .dtx 6
 - .rtx .. 11–13, 24, 29, 30, 87, 107
 - .rty 11, 73
 - .sty 30
 - \@end 227, 3233
 - \@footnotetext 1536, 1540
 - \@ontopof 2109, 2110, 2111, 2112,
2115
 - \@par 2760
 - \@FMN@list 1454, 1616
 - \@LN@LError .. 2011, 2012, 2013
 - \@LN@LError@ltx ... 2004, 2013
 - \@LN@LError@org ... 1996, 2011
 - \@LN@parpgbrk 72
 - \@LN@parpgbrk 2018
 - \@Roman 1118
 - \@TBN@opr 1453
 - \@affils@sw 35
 - \@afterheading 955, 963
 - \@afterindentfalse 933
 - \@appendixcntformat 2999, 3381
 - \@author@parskip 2747
 - \@auxout .. 774, 1586, 3208, 3423
 - \@begindocumenthook 20
 - \@beginparpenalty 1020
 - \@bibdataout 59, 60
 - \@bibdataout . 1555, 1564, 1576,
1579, 3197, 3412
 - \@bibdataout@aps 111, 124
 - \@bibdataout@aps .. 1574, 3195,
3411
 - \@bibdataout@init 111
 - \@bibdataout@init .. 1574, 3195
 - \@bibdataout@rev 55
 - \@bibdataout@rev .. 1477, 1578,
3195
 - \@bibdataout@rmp 3411
 - \@bibitemShut . 1366, 1367, 1375,
1376, 1423, 1426, 1429
 - \@biblabel 124
 - \@bibstop 1363, 1372
 - \@bibstyle 1416, 1475, 1476, 3017,
3211, 3409
 - \@booleanfalse
.. 272, 276, 283, 291, 296,
302, 304, 305, 310, 313, 360,
361, 363, 364, 372, 374, 377,
379, 384, 385, 387, 409, 410,
414, 420, 422, 423, 428, 429,
441, 442, 450, 461, 462, 463,
467, 468, 564, 566, 567, 590,
593, 1417, 1651, 2697, 2698,
2968, 3017, 3114, 3188, 3440,
3447
 - \@booleantrue 264,
265, 267, 268, 279, 284,
293, 299, 307, 312, 314, 359,
362, 371, 373, 375, 376, 378,
383, 386, 408, 413, 421, 427,
431, 435, 440, 449, 461, 463,
464, 465, 466, 563, 565, 581,
582, 585, 586, 587, 591, 592,
925, 1416, 1659, 1660, 1882,
1886, 3194, 3217, 3410
 - \@caption@fignum@sep 41
 - \@caption@fignum@sep ... 1068,
1082, 3404, 3408
 - \@cite 55
 - \@citea 50
 - \@citea .. 1345, 1348, 1350, 1355,
1359
 - \@citex 55
 - \@citex 1499
 - \@clubpenalty 3069
 - \@ctrerr 2651
 - \@currentHref 3042
 - \@currentlabel 1457
 - \@currenvir 1671
 - \@currext 29
 - \@currext 608, 619, 632, 646
 - \@currname 29
 - \@currname ... 608, 619, 632, 646
 - \@dblfloat 1034, 1115, 1197
 - \@dblfloatplacement 1707, 1713
 - \@dblfpbot 2295, 2521
 - \@dblfpsep 2294, 2520
 - \@dblfpstop 2293, 2519

<code>\@depth</code>	....	241, 243, 1789, 2064
<code>\@doendnote</code>	.....	59
<code>\@dottedtocline</code>	.....	1037
<code>\@ehb</code>	.....	572
<code>\@empty</code>	.....	35, 55
<code>\@endnotelabel</code>	..	1546, 1557, 1558
<code>\@endnotesinbib</code>	.....	60, 61
<code>\@endnotesinbib</code>	.....	1592
<code>\@endnotesinbibliography</code>	..	60
<code>\@endnotesinbibliography</code>	.....	1592
<code>\@endnotetext</code>	.....	58, 59
<code>\@endnotetext</code>	.....	1547, 1552
<code>\@endnotetext@note</code>	.....	58
<code>\@endpage</code>	.....	33
<code>\@endparpenalty</code>	.....	1021
<code>\@endpetrue</code>	.....	1810
<code>\@evenfoot</code>	..	702, 719, 730, 739, 759, 769, 2793
<code>\@evenhead</code>	..	703, 720, 727, 736, 761, 767, 2785
<code>\@firstofone</code>	..	1067, 2141, 2157
<code>\@floatboxreset</code>	.....	1129
<code>\@floatplacement</code>	...	1706, 1712
<code>\@fltovf</code>	.....	27
<code>\@fltovf</code>	.....	568
<code>\@fltstk</code>	.....	27
<code>\@fltstk</code>	.....	568
<code>\@flushglue</code>	.....	.. 2712, 2713, 2717, 2722, 2723, 2725, 2970, 3246, 3247, 3249, 3255, 3256, 3258
<code>\@fnsymbol</code>	.....	89
<code>\@fnsymbol</code>	.....	2631
<code>\@fontswitch</code>	.....	1839, 1840
<code>\@footnotemark</code>	.....	61
<code>\@footnotemark</code>	.....	1071, 1532
<code>\@footnotemark@gobble</code>	...	1056, 1070
<code>\@footnotetext</code>	.....	1540, 1764
<code>\@for</code>	.....	609, 620, 633, 647
<code>\@fpbot</code>	.....	2292, 2518
<code>\@fpsep</code>	.....	2291, 2517
<code>\@fptop</code>	.....	2290, 2516
<code>\@gobble@leavemode@uppercase</code>	.....	2759, 2763
<code>\@gobble@opt@i</code>	.....	1072, 1074
<code>\@gobble@tw@</code>	.....	2927, 2929
<code>\@gobblethree</code>	.....	1648, 1674
<code>\@gtempa</code>	.....	18
<code>\@halignto</code>	.....	1244, 1261
<code>\@hang@from</code>	.....	2821
<code>\@hang@froms</code>	.....	1334
<code>\@hangfrom</code>	....	2834, 2890, 3349
<code>\@hangfrom@</code>	.....	95, 117
<code>\@hangfrom@appendix</code>	.....	2999, 3381
<code>\@hangfrom@section</code>	.....	39
<code>\@hangfrom@section</code>	.....	2834, 3001, 3349, 3382
<code>\@hangfrom@section@preprintsty</code>	.....	2890
<code>\@hangfroms@appendix</code>	.....	2999, 3381
<code>\@hangfroms@section</code>	.....	1334, 2835, 3002, 3350
<code>\@height</code>	...	241, 243, 1784, 2064
<code>\@highpenalty</code>	.....	1019
<code>\@idxitem</code>	.....	3081, 3087
<code>\@if@empty</code>	.....	1442, 3007, 3010, 3273, 3387, 3390, 3394
<code>\@ifdim</code>	.....	1052, 2119
<code>\@ifl@aded</code>	.....	530, 539
<code>\@ifl@aded@LaTeX</code>	.....	530, 539
<code>\@ifl@t@r</code>	.....	535, 544
<code>\@ifl@t@r@LaTeX</code>	.....	535, 544
<code>\@ifl@ter</code>	.....	534, 543
<code>\@ifl@ter@LaTeX</code>	.....	534, 543
<code>\@ifmmode</code>	.....	2657
<code>\@ifnextchar</code>	.....	1072, 1482
<code>\@ifnotrelax</code>	.....	254, 610, 621, 634, 648, 1234
<code>\@ifnum</code>	.....	604, 744, 751, 936, 945, 1347, 1348, 1618, 1676, 1677, 1678, 1679, 2040, 2041, 2042, 2803, 3133, 3449
<code>\@ifpackagelater</code>	..	533, 542, 551
<code>\@ifpackagelater@LaTeX</code>	.....	533, 542
<code>\@ifpackageloaded</code>	.....	531, 540, 550, 665, 1233, 2015
<code>\@ifpackageloaded@LaTeX</code>	..	531, 540
<code>\@ifstar</code>	..	1100, 1175, 1224, 1729
<code>\@ifundefined</code>	.....	57
<code>\@ifvmode</code>	.....	2760, 3274
<code>\@ifx</code>	.....	475, 486, 1366, 1375, 1411, 1486, 1502, 1509, 1523, 2011, 3214
<code>\@ifx@empty</code>	..	1067, 1331, 1423, 1426, 1429, 1439, 1616
<code>\@ifxundefined</code>	.....	.. 316, 471, 482, 507, 516, 526, 623, 637, 651, 672, 679,

692, 865, 868, 872, 876, 880, 884, 890, 893, 897, 901, 905, 909, 1208, 1475, 2016, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2656, 3231, 3316, 3319, 3323, 3327, 3331, 3335	\@mpfootins 1027
\@itempenalty 1022	\@mpmakefnmark 1075
\@journal 12, 74, 87, 113	\@ne 48, 52
\@journal . . . 482, 484, 486, 487, 491, 492, 493, 494, 495, 637, 640, 674, 679, 681, 686, 793, 2027, 3231	\@nobreakfalse 1974
\@journal@default 74	\@nobreaktrue . 1336, 3030, 3122, 3432
\@journal@default . . 2028, 3094	\@oddfn 702, 719, 729, 738, 758, 768, 2786, 2793
\@keys@name 1862	\@oddfn 704, 721, 728, 737, 760, 766, 2779, 2785
\@latex@error 569	\@onlinecite 53
\@latex@warning 575	\@onlinecite 1432
\@let@token 55	\@ontopof 2085, 2102, 2103, 2104, 2105, 2106
\@let@token 1496, 1502	\@options 2031
\@linenumberpar 72	\@outputpage 20
\@linenumberpar 2018	\@pacs@name 1862
\@listI . . 1690, 2206, 2307, 2363, 2427, 2533, 3144, 3152, 3164, 3305	\@parboxrestore 1108
\@listi 48	\@parse@class@options 645
\@listi . . 1380, 1690, 1691, 2206, 2214, 2227, 2363, 2370, 2382, 2427, 2435, 2448, 3144, 3152, 3164, 3305	\@parse@class@options@ 29
\@listii 2314, 2538	\@parse@class@options@ . . . 607, 2027, 2029
\@listiii 2322, 2544	\@parse@class@options@journal 631
\@listiv 2331, 2550	\@parse@class@options@society 29
\@listv 2336, 2553	\@parse@class@options@society 607, 2025
\@listvi 2341, 2556	\@parse@version 536, 545
\@lowpenalty . 1017, 1020, 1021, 1022	\@parse@version@LaTeX . 536, 545
\@make@capt@title . 1050, 1057, 1066	\@part 68
\@makecaption 1038, 3397	\@part 934, 935
\@makefnmark . 1079, 1109, 1265, 2981, 2994	\@pkgextension 532, 541
\@makefnmark@cite 1329	\@pkgextension@LaTeX . 532, 541
\@makefnmark@latex 1109	\@pnumwidth 2915
\@makefnmark 1265, 2974	\@pointsize 17, 31, 35, 74, 79, 82, 83, 108
\@medpenalty 1018	\@pointsize . 266, 321, 322, 323, 324, 651, 654, 692, 693, 694, 699, 2029, 3133
\@minipagefalse 1060	\@pointsize@default . . . 31, 74
\@mmm 1423, 1426, 1429	\@pointsize@default 2030, 3095
\@mparswitchfalse 383	\@preprint 2782
\@mparswitchtrue 384	\@process@journal . . . 668, 2028
\@mpfn . . . 1468, 1530, 1618, 2992	\@process@pointsize . 668, 2030
	\@process@society . . . 668, 2026
	\@ptionlist 29
	\@ptionlist . . 608, 619, 632, 646
	\@ptsize 17
	\@secntformat 2820, 3340

<code>\@secpenalty</code>	2933, 2954	<code>\@xfloat@prep</code>	43
<code>\@sectioncntformat</code>	3003, 3383	<code>\@xfloat@prep</code>	1107
<code>\@setfontsize</code>	2201, 2209, 2222, 2235, 2238, 2241, 2244, 2247, 2250, 2253, 2358, 2366, 2378, 2390, 2393, 2396, 2399, 2402, 2405, 2408, 2422, 2430, 2443, 2456, 2459, 2462, 2465, 2468, 2471, 3136, 3139, 3147, 3159	<code>\sqcup</code>	31, 41, 182, 1323, 1404, 2006, 2587, 2588, 2589, 2590, 2591, 2592, 2595, 2596, 2597, 2598, 2599, 2600, 2601, 2602, 2603, 2604, 2605, 2606, 2607, 2608, 2609, 2611, 2612, 2613, 2614, 2615, 2616, 2617, 2618, 2619, 2620, 2621, 2622, 2623, 2624, 2625, 2626, 2628, 2629, 2630, 2762, 2981, 2994, 3010, 3016, 3064, 3390, 3394, 3396, 3435
<code>\@setsize</code>	3300	<code>\^</code>	1571
<code>\@society</code>	12, 29, 30, 74, 87, 113	<code>_</code>	69
<code>\@society</code>	471, 473, 475, 476, 672, 674, 676, 686, 699	<code>\|</code>	2639
<code>\@spart</code>	934, 957	10pt document class option	4, 31, 79, 127
<code>\@sptoken</code>	55	11pt document class option	4, 31, 82, 85, 127
<code>\@sptoken</code>	1502	11pt.rtx	82
<code>\@startflt</code>	1965, 1991	12pt document class option	4, 31, 83, 85, 127
<code>\@startsection</code>	965, 974, 983, 992, 1001, 2823, 2837, 2849, 2861, 2870, 2879, 2892, 2904, 3342, 3352, 3360, 3368, 3376	12pt.rtx	83
<code>\@starttoc</code>	1989	<code>\sqcup</code>	127, 129, 130
<code>\@subsectioncntformat</code>	39	A	
<code>\@tempa</code>	470, 472, 473, 475, 476, 481, 483, 484, 486, 487, 608, 609, 619, 620, 632, 633, 646, 647, 1485, 1499, 2059, 2071, 2072, 2073, 2074, 2192, 2197, 2198, 2349, 2354, 2355, 2413, 2418, 2419, 2562, 2567, 2568, 3224, 3229, 3230	<code>\abovecaptionskip</code>	1038, 1040, 1045, 3399
<code>\@tempskipa</code>	3246, 3249, 3255, 3258	<code>\abovedisplayshortskip</code>	2204, 2212, 2225, 2361, 2368, 2380, 2425, 2433, 2446, 3142, 3150, 3162, 3303
<code>\@textcite</code>	53	<code>\abovedisplayskip</code>	2202, 2203, 2204, 2205, 2210, 2211, 2223, 2224, 2359, 2360, 2361, 2362, 2367, 2375, 2379, 2387, 2423, 2424, 2431, 2432, 2444, 2445, 3140, 3141, 3142, 3143, 3148, 3149, 3150, 3151, 3160, 3161, 3162, 3163, 3301, 3302, 3303, 3304
<code>\@textcite</code>	1433	abstract environment	68
<code>\@textsuperscript</code>	1277, 2749	<code>\abstractname</code>	68
<code>\@thefnmark</code>	1278, 1329, 1531, 1537, 1540, 1543, 1546, 2750	<code>\abstractname</code>	1855, 2675, 3282
<code>\@tocrmarg</code>	2916	<code>\Accepted@name</code>	1867
<code>\@totalleftmargin</code>	2695, 3251, 3259, 3270, 3293	acknowledgements environment	38
<code>\@twosidefalse</code>	381		
<code>\@twosidetrue</code>	381		
<code>\@undefined</code>	324, 491, 674, 853, 855, 857, 859, 861, 863		
<code>\@unexpandable@protect</code>	1570		
<code>\@width</code>	241, 243, 2064		
<code>\@xendnote</code>	1542		

acknowledgments environment 69
\acknowledgments@sw . 915, 925,
3114
\acknowledgmentsname 69
\acknowledgmentsname 916, 920,
1858
\addcontentsline 58
\addcontentsline . 920, 938, 940,
3041
\address 1872
\addtocontents . 1728, 2921, 2923
\adjust@abstractwidth . . . 2684,
2686, 2767, 2774
\adv 2586
\affiliation 1872
\aftergroup . . 1460, 1499, 1654,
1660
\agt 2087
\allow@breaking@tables . . . 269,
270, 274
\Alph 802, 873, 1733, 3324
\alph 796, 881, 1725, 3332
\alt 2087
\altaddress 1873
\altaffiliation 18
\altaffiliation 1873
\altaffilletter@sw 362
\altprecsim . . . 2088, 2090, 2183
\altsuccsim . . . 2087, 2089, 2182
\amfonts 500
amfonts document class . 10, 11,
35, 77
amfonts document class option 10,
25
\amsmath 518
amsmath document class 10, 28, 76
amsmath document class option 26
\amssymb 509
amssymb document class 10, 11, 35,
76
amssymb document class option 10,
25
\andname 1861
\ao 2587
\ap 2588
\apj 2591
\apl 2589
\apm 2590
\appdef 80
\appdef 232, 260, 315,
358, 380, 396, 399, 402, 403,
415, 424, 434, 437, 443, 451,
497, 506, 515, 524, 527, 529,
538, 595, 603, 665, 778, 785,
788, 1093, 1096, 1107, 1108,
1129, 1141, 1144, 1172, 1207,
1217, 1220, 1232, 1244, 1255,
1261, 1348, 1381, 1521, 1574,
1612, 1686, 1698, 1831, 1942,
1960, 1963, 2010, 2022, 2033,
2255, 2476, 2495, 2655, 2699,
3018, 3022, 3061, 3066, 3115,
3126, 3132, 3195, 3213, 3297,
3381, 3426, 3441
\appendix 1718, 1728, 1986, 2999,
3381
\appendix@toc 1986
\appendixesname 68
\appendixesname 1856
\appendixname . 1856, 3016, 3394,
3396
\appendixontrue 1720
\aprop 2597
aps document class option . . 4, 10,
11, 87, 113
aps.rtx 12, 31, 87, 113
aps.sty 43
aps1Opt.rtx 79
apsrev.bst 99
apsrev.dbj 103, 105
apsrmp.bst 99, 118
apsrmp.dbj 105, 122
apsrmp.rtx 111–113
\arabic 446,
794, 877, 885, 898, 902, 906,
910, 1010, 1457, 1724, 3328,
3336
\array@default 275, 1243
\array@row@pre . 1251, 1252, 1256
\array@row@pre@default . . 1251,
1256
\array@row@pre@float 1252, 2969
\array@row@pst . 1253, 1254, 1257
\array@row@pst@default . . 1253,
1257
\array@row@pst@float 1254, 2969
\array@row@rst 1255
\arraycolsep 1023
\arrayrulewidth 1025

article document class .. 10, 48
 \assp 2596
 \AtBeginDcoument 20
 \AtBeginDocument 11, 12, 48, 56,
 59, 60, 74
 \AtEndDocument 12, 21, 26
 \AtEndOfClass 1481
 \AtEndOfClass 11
 \att@TOC 1978, 1988
 auguide.tex 5
 \author 33
 author-year document class option
 21
 \authoryear@sw . 21, 60, 105, 124
 \authoryear@sw . 408, 1594, 3017,
 3410
 \auto@bib 61
 \auto@bib 358, 1615
 \auto@bib@empty 1436, 1460, 1615
 \auto@bib@innerbib 54, 62
 \auto@bib@innerbib 1438, 1456,
 1615

B
 balancelastpage document class option
 16
 \balancelastpage@sw . 306, 1773
 \baselineskip ... 241, 243, 2097,
 2715, 3027, 3119, 3254
 \baselinestretch
 .. 1016, 1266, 2497, 2499,
 2798, 2975, 2987
 \Bbb 77
 \Bbb 2144
 \bbox 1947
 \begin 11
 \bell 2592
 \belowcaptionskip . 1039, 1041,
 1064, 3397, 3406
 \belowdisplayshortskip
 .. 2205, 2213, 2226, 2362,
 2369, 2381, 2426, 2434, 2447,
 3143, 3151, 3163, 3304
 \belowdisplayskip
 .. 2203, 2211, 2224, 2360,
 2375, 2387, 2424, 2432, 2445,
 3141, 3149, 3161, 3302
 \bf 946, 949, 959, 1835, 2941, 2956
 \bib@device ... 3028, 3036, 3120
 \bibAnnote 1362, 1648
 \bibAnnoteFile 1647
 \bibdata 53
 \bibdata@app 58
 \bibdata@app 1549, 3021
 \bibdata@ext 58
 \bibdata@ext 1549, 1576
 \bibfield 103, 122
 \bibfield 1639
 \bibfieldnamefont 100, 119
 \bibfont 3066
 \bibhang 3426
 \bibinfo 71, 103, 122
 \bibinfo 1640, 1940
 \bibitem 19, 54, 61, 62, 103, 112,
 122, 125
 \bibitem 1652
 \bibitem@NoStop 1365, 1374, 1420
 \bibitem@set 62
 \bibitem@set 1615
 \bibitem@Stop .. 1364, 1373, 1419
 \bibitem@sw .. 1651, 1654, 1658,
 1659, 1660
 \bibitemContinue ... 1420, 1425
 \bibitemContinue@Stop ... 1419,
 1428
 \bibitemNoStop 1365, 1374, 1422,
 1644
 \BibitemOpen 1642
 \BibitemShut 51, 53
 \BibitemShut . 1362, 1411, 1412,
 1413, 1646
 \bibitemShut . 1366, 1367, 1375,
 1376
 \BibitemShut@ltx ... 1370, 1413
 \bibitemStop .. 1364, 1373, 1643
 \bibliography 61
 \bibliography .. 1434, 1630, 1666
 \bibliography@latex 1434, 1440,
 1443, 1445
 \bibliographystyle . 12, 52, 55,
 99, 118
 \bibliographystyle . 1385, 1415
 \bibliographystyle@latex 1385,
 1415, 1476
 \bibliographystyle@sw 52
 \bibliographystyle@sw ... 1416,
 1417, 1477
 \bibnamefont 100, 119
 bibnotes document class option 18,
 109

<code>\bibnumfmt</code>	19, 52	<code>\cdots</code>	2085
<code>\bibnumfmt</code>	1387	<code>\centering</code>	1108, 2674, 2714, 2724, 2745, 2758, 2831, 2845, 2857, 2887, 2900, 2912, 3281
<code>\bibpreamble</code>	1387, 3036, 3426	<code>\cha</code>	2594
<code>\bibpunct</code>	48, 124, 125	<code>\change@journal</code>	469, 2570, 2571, 2572, 2573, 2574, 2575, 2577, 2578, 2579, 2581, 2582, 2583, 2584, 2585
<code>\bibpunct</code>	3018, 3426	<code>\change@society</code>	469, 491, 492, 493, 494, 495, 612, 658
<code>\bibsection</code>	49	<code>\changes</code>	58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 2576, 2580
<code>\bibsection</code>	1387, 3022, 3116, 3426	<code>\chapter</code>	57
<code>\bibsep</code>	3036, 3426	<code>\checkindate</code>	273, 727, 728, 736, 737, 758, 759, 2790
<code>\bibstyle</code>	55	<code>\citation</code>	60, 112, 124
<code>\Big</code>	2161, 2165	<code>\citation</code>	1586, 3208, 3423
<code>\big</code>	2163, 2167	<code>\cite</code>	48–50, 55, 105, 124, 125
<code>\Bigg</code>	2160, 2164	<code>\cite</code>	3426
<code>\bigg</code>	2162, 2166	<code>cite</code> document class	11, 34, 55, 56
<code>\Bigglb</code>	2160	<code>\citealp</code>	48
<code>\bigglb</code>	2162	<code>\citealpnum</code>	48
<code>\Biggrb</code>	2164	<code>citeautoscript</code> document class op- tion	55, 56
<code>\biggrb</code>	2166	<code>\citeautoscript@sw</code>	371, 1522
<code>\Biglb</code>	2161		
<code>\biglb</code>	2163		
<code>\Bigrb</code>	2165		
<code>\bigrb</code>	2167		
<code>\bm</code>	1929, 1930, 1940, 1948		
<code>bm</code> document class	10, 11		
<code>\bmf</code>	2593		
<code>\boldmath</code>	14		
<code>\boldmath</code>	255, 256, 257, 1919, 1920, 1921, 1922		
<code>book</code> document class	10		
<code>\botrule</code>	1241		
<code>\bottomfraction</code>	812		
<code>\byrevtex</code>	2787, 2795		
<code>byrevtex</code> document class option	27		
<code>\byrevtex@sw</code>	27, 35		
<code>\byrevtex@sw</code>	563, 2795		
C			
<code>\c@figure</code>	1086		
<code>\c@float@type</code>	1208		
<code>\c@footnote</code>	113		
<code>\c@NAT@ctr</code>	50, 60		
<code>\c@NAT@ctr</code>	1346, 1348		
<code>\c@page</code>	63		
<code>\c@page</code>	773, 1685, 1699, 2667		
<code>\c@secnumdepth</code>	708, 714, 744, 751, 936, 945, 3075, 3131		
<code>\c@table</code>	1118		
<code>\c@video</code>	1200		
<code>\cal</code>	1839		
<code>\case</code>	1895		

<code>\citenamelfont</code>	100, 119	<code>\close@column@grid</code>	1760, 1820
<code>\citep</code>	125	<code>clsguide.tex</code>	73
<code>\citep</code>	3438	<code>\clubpenalty</code>	3069
<code>\citet</code>	48	<code>\code specific to the josaa</code>	placeholder
<code>\citeyear</code>	1310, 1408		13
<code>\class@amsfonts</code>	35	<code>\colrule</code>	1240, 1890, 1891
<code>\class@amsfonts</code>	501, 504, 507	<code>\columnsep</code>	15
<code>\class@amsmath</code>	519, 522, 526	<code>\columnsep</code>	416, 1744, 2277, 2503, 3074
<code>\class@amssymb</code>	35	<code>\columnseprule</code>	2278, 2504, 3073
<code>\class@amssymb</code>	510, 513, 516	<code>\columnwidth</code>	1186, 1744
<code>\class@documenthook</code>	11, 20, 61, 63, 74	<code>\compose@footnotes</code>	1817
<code>\class@documenthook</code>	396, 402, 596, 1093, 1217, 1521, 1574, 1612, 1698, 1963, 2010	<code>\compose@footnotes@two</code>	1817
<code>\class@enddocumenthook</code>	12, 21	compress document class option	125
<code>\class@enddocumenthook</code>	358, 403, 527, 1096, 1144, 1220	<code>\copy</code>	2125, 2171, 2172, 2174
<code>\class@info</code>	255, 472, 483, 1412, 2012, 2048, 2199, 2356, 2420, 2569, 3097, 3100, 3103, 3106, 3109, 3112, 3172, 3175, 3178, 3181, 3184, 3187, 3191, 3235	<code>\copyright</code>	31
<code>\class@name</code>	6	<code>\copyrightname</code>	1860
<code>\class@name</code>	18, 226	<code>\corresponds</code>	76
<code>\class@warn</code>	288, 319, 476, 487, 552, 673, 680, 694, 1590, 2050, 3216, 3232, 3443	<code>\corresponds</code>	2078
<code>\class@warn@end</code>	1875, 1881, 1885, 1890, 1929, 1948, 1952, 1957	<code>\count@</code>	50
<code>classes.dtx</code>	35	<code>\count@</code>	1347, 1348, 2801, 2803, 2818
<code>classes.dtx document class</code>	32	<code>\cp</code>	2630
<code>\classname</code>	30, 81, 151, 169, 173, 186	<code>\crrc</code>	2099, 2811
<code>\classoption</code>	72, 73, 74, 87, 164	<code>\cs</code>	59, 70, 71, 77, 78, 79, 80, 81, 86, 89, 97, 120, 123, 125, 127, 129, 131, 132, 133, 135, 136, 137, 140, 143, 144, 145, 147, 148, 149, 153, 158, 160, 162, 163, 165, 166, 171, 177, 178, 181, 186, 190
<code>\cleaders</code>	1795, 1807	<code>\csname</code>	26, 29, 50, 55
<code>\clear@document</code>	399, 778	<code>\csname</code>	254, 256, 257, 553, 610, 613, 621, 622, 634, 636, 648, 650, 659, 689, 1091, 1092, 1123, 1124, 1168, 1169, 1172, 1212, 1213, 1234, 1288, 1296, 1304, 1468, 1509, 1517, 1518, 1519, 1520, 1618, 1971, 1972, 1984, 2820, 2992, 3016, 3340, 3396
<code>\cleardoublepage</code>	20	<code>\curr@envir</code>	1700, 1701
<code>\clearpage</code>	12, 21, 42, 43	<code>\CurrentOption</code>	609, 610, 611, 612, 613, 620, 621, 622, 633, 634, 636, 647, 648, 650, 657, 658, 659
<code>\clearpage</code>	400, 401, 404	custom-bib document class	30, 99, 118
<code>\clearpage@ltx</code>	400, 401		
<code>\clo@</code>	90		
<code>\clo@groupedaddress</code>	2661, 3236, 3265		
<code>\close@column</code>	21, 65		
<code>\close@column</code>	401, 1736, 1820		
<code>\close@column@grid</code>	66		

D

<p><code>\dagger</code> 2635, 2641, 2646</p> <p><code>\date</code> 69</p> <p><code>\date</code> 36</p> <p><code>\Dated@name</code> 1867</p> <p><code>\dateinRH@sw</code> 264, 272, 273</p> <p><code>\dblfloatpagefraction</code> 36</p> <p><code>\dblfloatpagefraction</code> 818</p> <p><code>\dblfloatsep</code> 2288, 2514</p> <p><code>\dbltextfloatsep</code> ... 2289, 2515</p> <p><code>\dbltopfraction</code> 817</p> <p>dcolumn document class 47</p> <p><code>\ddagger</code> 2636, 2642, 2647</p> <p><code>\ddd</code> 76</p> <p><code>\ddd</code> 2080, 2180</p> <p><code>\DeclareBoldMathCommand</code> ... 78</p> <p><code>\DeclareMathSizes</code> . 3154, 3155, 3156</p> <p><code>\DeclareOldFontCommand</code> 1832, 1833, 1834, 1835, 1836, 1837, 1838</p> <p><code>\DeclareOption</code> 31, 74</p> <p><code>\DeclareRobustCommand</code> 1282, 1290, 1298, 1432, 1433, 1839, 1840, 1901, 1915, 1928, 2057, 2077, 2078, 2079, 2080, 2081, 2084, 2087, 2088, 2091, 2092, 2093, 2094, 2102, 2103, 2104, 2105, 2128, 2136, 2144, 2152, 2657</p> <p><code>\def@after@address</code> 3260</p> <p><code>\def@after@address@empty</code> 3260</p> <p><code>\descriptionlabel</code> 841, 847</p> <p><code>\dimen@</code> .. 1794, 1795, 1806, 1807, 2282, 2283, 2508, 2509, 2687, 2688, 2690, 2692, 2693, 3312, 3313</p> <p><code>\displaystyle</code> . 1905, 1919, 2071, 2109</p> <p><code>\do</code> 609, 620, 633, 647</p> <p><code>\do@if@floats</code> .. 1094, 1139, 1218</p> <p><code>\do@output@cclv</code> 779</p> <p><code>\DocInput</code> 10</p> <p>document class</p> <ul style="list-style-type: none"> <code>amsmath</code> 10, 11, 35, 77 <code>amsmath</code> 10, 28, 76 <code>amssymb</code> 10, 11, 35, 76 <code>article</code> 10, 48 <code>bm</code> 10, 11 <code>book</code> 10 	<p><code>cite</code> 11, 34, 55, 56</p> <p><code>classes.dtx</code> 32</p> <p><code>custom-bib</code> 30, 99, 118</p> <p><code>dcolumn</code> 47</p> <p><code>geometry</code> 14, 15, 63, 109</p> <p><code>graphicx</code> 11</p> <p><code>hyperref</code> 11, 46, 132</p> <p><code>latex2e</code> 76</p> <p><code>lineno</code> 28, 72, 131, 132</p> <p><code>listings</code> 57</p> <p><code>longtable</code> 11, 14</p> <p><code>ltxdoc</code> 10</p> <p><code>ltxfront</code> 13</p> <p><code>ltxgrid</code> 3, 13, 20, 26–28, 34, 65, 133</p> <p><code>ltxutil</code> 13, 23</p> <p><code>mathtime</code> 109</p> <p><code>mcite</code> 34, 52</p> <p><code>multicol</code> 11, 34, 127</p> <p><code>natbib</code> 10–12, 19, 34, 48–53, 55–57, 74, 106, 125</p> <p><code>overcite</code> 10</p> <p><code>revtex4</code> 1, 13, 79, 82, 83, 87, 113</p> <p><code>revtex4-2</code> 1</p> <p><code>textcase</code> 25</p> <p><code>times</code> 109</p> <p>document class option</p> <ul style="list-style-type: none"> <code>10pt</code> 4, 31, 79, 127 <code>11pt</code> 4, 31, 82, 85, 127 <code>12pt</code> 4, 31, 83, 85, 127 <code>amsmath</code> 10, 25 <code>amsmath</code> 26 <code>amssymb</code> 10, 25 <code>aps</code> 4, 10, 11, 87, 113 <code>author-year</code> 21 <code>balancelastpage</code> 16 <code>bibnotes</code> 18, 109 <code>byrevtex</code> 27 <code>citeautoscript</code> 55, 56 <code>compress</code> 125 <code>draft</code> 22 <code>endfloats</code> 43, 46 <code>eprint</code> 20 <code>eqsecnum</code> 12, 23, 40 <code>floatfix</code> 27 <code>flushbottom</code> 22 <code>footinbib</code> 111 <code>galley</code> 21, 35 <code>groupauthors</code> 127
--	---

environment		<code>\false@sw</code>	1100, 1175, 1224, 1654, 2043, 2657
abstract	68	<code>\fboxrule</code>	1029
acknowledgements	38	<code>\fboxsep</code>	1028
acknowledgments	69	figure (env.)	1030
document	6, 11, 124	figure environment	3, 41–43, 45, 68
figure	3, 41–43, 45, 68	<code>\figurename</code>	68
longtable	44	<code>\figurename</code>	1090, 1851
table	3, 43–45, 68	<code>\figuresname</code>	68
tabular	15	<code>\figuresname</code>	1852
thebibliography	48, 51, 54, 60, 62, 63, 68, 99, 118, 133	file	
thebibliography@nogroup	63	.aux	12, 33, 55
theindex	68	.bbl	99, 118
video	3, 45, 46	.bst	99, 118
widetext	66	.dtx	6
environments:		.rtx	11–13, 24, 29, 30, 87, 107
figure	1030	.rty	11, 73
rtx@thebibliography	1451	.sty	30
ruledtabular	1231	11pt.rtx	82
table	1111	12pt.rtx	83
video	1193	□	127, 129, 130
widetext@galley	1744	aps.rtx	12, 31, 87, 113
widetext@grid	1778	aps.sty	43
<code>\EOS</code>	1645	aps10pt.rtx	79
<code>\eprint</code>	125	apsrev.bst	99
<code>\eprint</code>	1940, 3452	apsrev.dbj	103, 105
eprint document class option	20	apsrmp.bst	99, 118
<code>\eprint@enable@sw</code>	376, 1582	apsrmp.dbj	105, 122
<code>\eqnum</code>	1956	apsrmp.rtx	111–113
eqsecnum document class option	12, 23, 40	auguide.tex	5
<code>\eqsecnum@sw</code>	23, 35	classes.dtx	35
<code>\eqsecnum@sw</code>	443	clsguide.tex	73
<code>\errhelp</code>	222	driver	6
<code>\errmessage</code>	226	fleqn.clo	23
<code>\evensidemargin</code>	15	hyperref.dtx	46
<code>\evensidemargin</code>	2258, 2260, 2264, 2479, 2483	hyperref.sty	6
<code>\everymath</code>	1905, 1906, 1907, 1908, 1919, 1920, 1921, 1922	ltxdoc.sty	6
<code>\expandafter</code>	55	ltxdocext.sty	6
<code>\ext@figure</code>	1089	ltxfront.dtx	27, 28
<code>\ext@table</code>	1121	ltxgrid.dtx	15
<code>\ext@video</code>	1201	ltxutil.dtx	61, 97
F		makebst.tex	99, 118
<code>\f@size</code>	1907, 1908	myarticle.rty	73
<code>\f@ur</code>	2117, 2119, 2120, 2121, 2123, 2124, 2125, 2508	myarticle.tex	73
<code>\false@sw</code>	19, 52, 112	natbib	118
		natbib.cfg	48
		options	13
		osa.rtx	12
		osajnl.rtx	25

README	5	\force@deferlist@sw	565, 571, 577
README-REVTEX.txt	6	\fp@proc@H	270
revtex2	43	\fp@proc@h	269
template.aps	5	\fps@figure	1087
template.rty	73	\fps@table	1119
\file ...	52, 54, 56, 88, 138, 1695, 1696	\fps@video	1204
\FL	1932	\FR	1933
\fleqn	458	\frac	1895, 1896
fleqn.clo	23	\frak	77
\float@link ...	1067, 1083, 1084	\frak	2128
floatfix document class option	27	\frontmatter@above@affilgroup	114
\floatp@sw	23, 35	\frontmatter@above@affilgroup	2719, 3262
\floatp@sw	461, 1100, 1175, 1224	\frontmatter@above@affiliation	114
\floatpagefraction	36	\frontmatter@above@affiliation	2721, 3263
\floatpagefraction	815	\frontmatter@above@affiliation@script	114
\floats@sw	23, 24, 35, 41, 43, 45, 46	\frontmatter@above@affiliation@script	2721, 3264
\floats@sw	276, 461, 1131	\frontmatter@abstractfont	2681, 3288
\floatsep	2285, 2511	\frontmatter@abstractheading	2671, 3278
\flushbottom	425	\frontmatter@abstractwidth ..	2680, 2687, 2702
flushbottom document class option	22	\frontmatter@affiliationfont	114
\flushing	1055, 1076, 3401	\frontmatter@affiliationfont	2703, 2732, 3253
\fname@video	1202, 1206	\frontmatter@authorbelow	2753
\fnum@figure	1090	\frontmatter@authorformat	2711, 3244
\fnum@table	1122	\frontmatter@collaboration@above	2735
\fnum@video	1206	\frontmatter@footnote	35
footinbib document class option	111	\frontmatter@footnote@produce	18
\footinbib@sw	18, 35, 49, 57, 60, 112	\frontmatter@footnote@produce	355, 3113
\footinbib@sw ..	359, 1593, 1617, 3194, 3215, 3217, 3440	\frontmatter@footnote@produce@endnote	355, 3113
\footins	15	\frontmatter@footnote@produce@footnote	18
\footins	2280, 2282, 2506, 2508, 3310, 3312	\frontmatter@footnote@produce@footnote	356, 357
\footnote	35, 61	\frontmatter@footnotetext	1764
\footnote	1056, 1897		
\footnotemark	1898		
\footnoterule ..	2281, 2507, 3311		
\footnotesep ..	2279, 2505, 3309		
\footnotesize	2221, 2222, 2377, 2378, 2442, 2443, 2766, 2773, 3289, 3454		
\footnotetext	1899		
\footskip	15		
\footskip	2274, 2493		

[\frontmatter@keys@format](#) [2772](#)
[\frontmatter@makefnmark](#) . [2747](#)
[\frontmatter@makefntext](#) . [2986](#)
[\frontmatter@PACS@format](#) [2764](#)
[\frontmatter@postabstractspace](#)
 [3295](#)
[\frontmatter@preabstractspace](#)
 [3295](#)
[\frontmatter@RRAP@format](#) [2756](#),
 [3266](#)
[\frontmatter@setup](#) . [2741](#), [3237](#)
[\frontmatter@thefootnote](#) . [113](#)
[\frontmatter@thefootnote](#) [1469](#)
[\frontmatter@title@above](#) [2744](#),
 [3241](#)
[\frontmatter@title@below](#) [2744](#),
 [3241](#)
[\frontmatter@title@format](#) [2744](#),
 [3241](#)
[\frontmatterverbose@sw](#) ... [592](#)
[\ftype@figure](#) .. [1088](#), [1091](#), [1092](#)
[\ftype@table](#) .. [1120](#), [1123](#), [1124](#)
[\ftype@video](#) .. [1205](#), [1212](#), [1213](#)
[\futurelet](#) [1496](#)

G

[\g@addto@macro](#) [1533](#)
[\g@bbblefirsttoken](#) . [1287](#), [1295](#),
 [1303](#), [1313](#)
galley document class option [21](#),
 [35](#)
[\galley@outdent](#) [1744](#), [1826](#)
[\galley@sw](#) [21](#)
[\galley@sw](#) [411](#), [1825](#), [2689](#)
[\GenericInfo](#) [212](#)
[\GenericWarning](#) [2194](#), [2351](#), [2415](#),
 [2564](#), [3226](#)
geometry document class . [14](#), [15](#),
 [63](#), [109](#)
[\GetFileInfo](#) [27](#)
[\glb@settings](#) [1909](#), [1923](#)
[\glossary](#) [58](#)
[\glossary](#) [1566](#)
graphicx document class [11](#)
groupauthors document class op-
tion [127](#)
[\groupauthors@sw](#) [35](#)
groupedaddress document class op-
tion [114](#)
[\gtrsim](#) [2087](#), [2185](#)

H

[\hb@xt@](#) .. [1061](#), [1079](#), [1269](#), [1782](#),
 [1788](#), [1803](#), [2062](#), [2120](#), [2123](#),
 [2124](#), [2787](#), [2943](#), [2980](#), [2993](#),
 [3037](#), [3038](#), [3043](#)
[\headheight](#) [15](#)
[\headheight](#) [2270](#), [2489](#)
[\heading@cr](#) . [727](#), [728](#), [736](#), [737](#),
 [756](#), [1049](#)
[\headsep](#) [15](#)
[\headsep](#) [2271](#), [2490](#)
[\hline](#) ... [1239](#), [1240](#), [1241](#), [2972](#),
 [2973](#)
[\hoffset](#) [15](#)
[\homepage](#) [18](#)
[\href](#) [1067](#)
[\hspace](#) [49](#)
[\ht](#) [1794](#), [1806](#), [2061](#), [2118](#), [2121](#),
 [2125](#)
[\Huge](#) [2252](#), [2253](#), [2407](#), [2408](#), [2473](#)
[\huge](#) . [949](#), [959](#), [2249](#), [2250](#), [2404](#),
 [2405](#), [2470](#), [2471](#), [2473](#)
[\Hy@raisedlink](#) [1466](#), [2992](#)
[\hyper@anchorend](#) .. [1466](#), [2992](#),
 [3055](#)
[\hyper@anchorstart](#) [1466](#), [2992](#),
 [3042](#)
hyperref document class . [11](#), [46](#),
 [132](#)
hyperref.dtx [46](#)
hyperref.sty [6](#)
hypertext document class option
..... [30](#), [132](#)
[\hypertext@enable@ltx](#) . [664](#), [665](#)

I

[\ialign](#) [2099](#)
[\if](#) [1323](#)
[\if@compatibility](#) [221](#)
[\if@filesw](#) [771](#), [1585](#), [1970](#), [3207](#),
 [3422](#)
[\if@mparswitch](#) [15](#), [20](#)
[\if@reversemargin](#) [15](#), [20](#)
[\if@twocolumn](#) [15](#)
[\if@twoside](#) [15](#), [20](#)
[\ifappendixon](#) [1717](#)
[\IfFileExists](#) [611](#), [657](#)
[\ifmmode](#) [1903](#), [1917](#)
[\ifNAT@super](#) [19](#)
[\ifNAT@swa](#) [1318](#)

<code>\ignorespaces</code> ..	756, 1779, 2942, 3275, 3408, 3455	<code>\l@@sections</code> .	2951, 2959, 2962, 3461, 3464, 3467
<code>\immediate</code>	774, 1158, 1160, 1555, 1576, 1579, 1586, 1972, 3197, 3208, 3412, 3423	<code>\l@f@section</code>	2953
<code>\incompatible@package</code>	789, 790, 791	<code>\l@figure</code>	1037, 1126, 1216
<code>\index</code>	58	<code>\l@paragraph</code>	2964, 3470
<code>\index</code>	1566	<code>\l@part</code>	97
<code>\indexname</code>	68	<code>\l@part</code>	2933
<code>\indexname</code>	1850 , 3077	<code>\l@section</code>	2926, 2927, 2931, 2948 , 3458
<code>\indexspace</code>	3093	<code>\l@section@saved</code> ...	2926, 2931
<code>\input</code>	23	<code>\l@subparagraph</code>	2965, 3471
<code>\InputIfFileExists</code> ..	689, 2023	<code>\l@subsection</code>	2958, 3463
<code>\interlinepenalty</code>	944, 958	<code>\l@subsubsection</code> ..	2961, 3466, 3469
<code>\intertextsep</code>	2287, 2513	<code>\l@table</code>	1126
<code>\iovs</code>	2599	<code>\l@video</code>	1216
<code>\it</code>	1836, 2703, 2733	<code>\label</code>	33, 58
<code>\item</code> ..	823, 831, 837, 1463, 1756, 3081	<code>\label</code>	1458, 1566
<code>\itemindent</code>	822, 830, 846, 1397, 1750	<code>\labelenumi</code>	793
<code>\itemsep</code> ..	822, 2218, 2231, 2311, 2320, 2329, 2373, 2385, 2439, 2452, 2535, 2542, 2548	<code>\labelenumii</code>	795
<code>\itshape</code> ..	989, 998, 1836, 2856, 2867, 2911	<code>\labelenumiii</code>	798
J			
<code>\j@nk</code>	1676, 1677, 1678, 1679	<code>\labelenumiv</code>	801
<code>\jap</code>	2601	<code>\labelitemi</code>	804
<code>\jcp</code>	2600	<code>\labelitemii</code>	805
<code>\jmo</code>	2603	<code>\labelitemiii</code>	806
<code>\jmp</code>	2602	<code>\labelitemiv</code>	807
<code>\jobname</code>	58, 111	<code>\labelsep</code> .	842, 1396, 1687, 1689, 2313, 2317, 2325, 2334, 2339, 2344, 2537, 2539, 2545, 2551, 2554, 2557
<code>\jor</code>	2629	<code>\labelwidth</code>	846, 1395, 1689, 2316, 2317, 2324, 2325, 2333, 2334, 2338, 2339, 2343, 2344, 2539, 2545, 2551, 2554, 2557
<code>\josa</code>	2604	<code>\lambda</code> ..	2071, 2072, 2073, 2074
<code>\josaa</code>	2605	<code>\lambdabar</code>	2057
josaa document class option ..	12	<code>\LARGE</code> ...	2246, 2247, 2401, 2402, 2467, 2468
<code>\josab</code>	2606	<code>\Large</code>	946, 2243, 2244, 2398, 2399, 2464, 2465, 3242
<code><journal-specific setup></code> placeholder	.....	<code>\large</code>	2240, 2241, 2395, 2396, 2461, 2462, 2674, 2745, 2941, 3135, 3136, 3281
.....	34	<code>\lastbox</code>	64
<code>\journalname</code>	1859	<code>\lastbox</code>	2807
<code>\jpp</code>	2607	<code>\lastpage@putlabel</code>	770
<code>\jpr</code>	2608	<code>\lastskip</code>	1488
<code>\jqe</code>	2595	<code>\LaTeX</code>	124, 255
L			
<code>\l@</code>	126	latex2e document class	76
<code>\l@@sections</code>	97		

<code>\leaders</code>	. 1783, 1790, 3045, 3047, 3049, 3051	<code>\listoffigures</code>	..... 68
<code>\leftarrow</code>	..... 2104	<code>\listoffigures</code>	..... 1036
<code>\leftmargin</code>	..... 823, 831, 837, 846, 1688, 1689, 1751, 2215, 2228, 2308, 2315, 2323, 2332, 2337, 2342, 2370, 2382, 2436, 2449, 2533, 2538, 2544, 2550, 2553, 2556	<code>\listoftables</code>	..... 68
<code>\leftmargini</code>	..... .. 1688, 2215, 2228, 2301, 2308, 2370, 2382, 2436, 2449, 2527, 2533	<code>\listoftables</code>	..... 1125
<code>\leftmarginii</code>	. 2302, 2315, 2316, 2528, 2538, 2539	<code>\listofvideos</code>	..... 1215
<code>\leftmarginiii</code>	2303, 2323, 2324, 2529, 2544, 2545	<code>\listparindent</code>	... 822, 829, 830, 1398, 1749
<code>\leftmarginiv</code>	. 2304, 2332, 2333, 2530, 2550, 2551	<code>\loarrow</code>	..... 2102
<code>\leftmarginv</code>	. 2305, 2337, 2338, 2531, 2553, 2554	<code>\lofname</code>	..... 68
<code>\leftmarginvi</code>	. 2306, 2342, 2343, 2532, 2556, 2557	<code>\lofname</code>	..... 1847
<code>\leftrightharrow</code>	..... 2102	longbibliography document class option	..... 19
<code>\leftskip</code>	..... 64	<code>\longbibliography@sw</code>	..... 19
<code>\leftskip</code>	2692, 2695, 2976, 2979, 2980, 2988, 2991, 2993, 3248, 3251, 3257, 3259, 3269, 3270, 3291, 3293	<code>\longbibliography@sw</code>	373 , 3200, 3415
<code>\lengthcheck@sw</code>	..... 22, 35	<code>\longtable</code>	..... 1167
<code>\lengthcheck@sw</code>	429 , 3127, 3134	longtable document class	11, 14
<code>\lessim</code>	..... 2087 , 2184	longtable environment	..... 44
<code>\let</code>	..... 48, 55, 57	<code>\lotname</code>	..... 68
<code>\let@environment</code>	..... .. 1132, 1133, 1134, 1135, 1136, 1137, 1164, 1165, 1166, 1383, 1384, 1665, 1818, 1822, 1937	<code>\lotname</code>	..... 1848
letterpaper document class option	..... 18	<code>\lovname</code>	..... 1203
<code>\linelabel</code>	..... 72	<code>\lower</code>	..... 2082, 2096
<code>\linelabel</code>	..... 1998, 2006	<code>\LT@cols</code>	..... 237
lineno document class	28, 72, 131, 132	<code>\LT@makecaption</code>	..... 234 , 236
<code>\linenumbers</code>	..... 72	<code>\LT@makecaption@rtx</code>	.. 234 , 236
<code>\linenumbers</code>	.. 599, 1998, 2006	<code>\LT@mcol</code>	..... 237
<code>\linenumbers@sw</code>	..... 594	<code>\LTcapwidth</code> 240
<code>\linenumbersep</code>	..... 598	<code>\ltp</code>	..... 2609
<code>\lineskip</code>	..... 1014, 2098	<code>\ltx@footmark</code>	.. 1597, 1603, 1607
listings document class	..... 57	<code>\ltx@footmark@latex</code>	1603, 1607
		<code>\ltx@footnote@pop</code>	..... 1606
		<code>\ltx@footnote@push</code>	. 1595, 1602
		<code>\ltx@foottext</code>	.. 1598, 1604, 1608
		<code>\ltx@foottext@latex</code>	1604, 1608
		<code>\ltx@no@footnote</code>	..... 1766
		ltxdoc document class	..... 10
		ltxdoc.sty	..... 6
		ltxdocext.sty	..... 6
		ltxfront document class	.... 13
		ltxfront.dtx	..... 27, 28
		ltxgrid document class	3, 13, 20, 26–28, 34, 65, 133
		ltxgrid.dtx	..... 15
		<code>\ltxgrid@foot@info@sw</code>	. 582, 587
		<code>\ltxgrid@info@sw</code>	..... 580
		ltxgridinfo document class option	..... 27
		<code>\ltx@dotsep</code>	..... 2918, 3457
		ltxutil document class	.. 13, 23
		ltxutil.dtx	..... 61, 97

M

`\mag` 15
`\make@footnote@endnote` 61
`\make@footnote@endnote` .. 1592,
 1613
`\makeatletter` 1968
`makebst.tex` 99, 118
`\makelabel` 847
`\MakeLowercase` 497
`\MakeTextUppercase` ... 95, 117
`\MakeTextUppercase`
 ... 743, 2763, 2834, 2835,
 2890, 3349, 3350
`\maketitle` 39
`\MakeUppercase` 497, 707
`\marginparpush` 2296, 2522
`\marginparsep` 15
`\marginparsep` 2268, 2487
`\marginparwidth` 15
`\marginparwidth` 2261, 2265, 2480,
 2484
`\mark@envir` 1701
`\markright` 58
`\mathbb` 77
`\mathbb` .. 2147, 2149, 2154, 2157,
 2158, 2187
`\mathbf` 1835
`\mathcal` 1839
`\mathchoice` .. 1904, 1918, 2070,
 2108
`\mathclose` 2178
`\mathfrak` 77
`\mathfrak` 2131, 2133, 2138, 2141,
 2142, 2186
`\mathit` 1836
`\mathletters` 1951
`\mathnormal` 1840
`\mathopen` 2177
`\mathord` . 2085, 2102, 2103, 2104,
 2105, 2121, 2125
`\mathpalette` 2091, 2092
`\mathparagraph` . 2638, 2644, 2649
`\mathrel` 2091, 2092
`\mathring` 76
`\mathring` 2079
`\mathrm` 1832
`\mathsection` .. 2637, 2643, 2648
`\mathsf` 1833
`mathtime document class` ... 109
`\mathtt` 1834

`\maxdimen` 3075, 3131
`\mbox` 1309, 1911, 1925
`mcite document class` 34, 52
`mcite document class option` . 125
`\mediumtext` 1935
`\MessageBreak` 553, 554
`\mini@note` 1528
`\mini@notes` 1528, 1541
`\minipagefootnote@foot` .. 1739,
 1770
`\minipagefootnote@init` .. 1737,
 1761
`\mit` 1840
`\moveleft` 64
`\moveright` 64
`\mtt` 2598
`multicol document class` . 11, 34,
 127
`myarticle.rty` 73
`myarticle.tex` 73

N

`\narrowtext` 1934
`\nat` 2610
`\NAT@@citetp` 55
`\NAT@@citetp` 1524
`\NAT@@close` 50
`\NAT@@close` 1355
`\NAT@bibitem@cont` 1418
`\NAT@BibitemShut` ... 1362, 1411
`\NAT@biblabel` 124
`\NAT@bibsetnum` 1387
`\NAT@bibsetup` 1387
`\NAT@citenum` 1308
`\NAT@citesuper` 49, 55
`\NAT@citesuper` . 1386, 1486, 1523
`\NAT@citeyear` 1310, 1408
`\NAT@cmprs` 48, 106
`\NAT@cmprs` 3450
`\NAT@conj` 1348, 1350, 1361
`\NAT@def@citea` 50, 125
`\NAT@def@citea` 1340
`\NAT@def@citea@box` 50
`\NAT@def@citea@box` 1342
`\NAT@def@citea@close` 50
`\NAT@def@citea@close` ... 1341
`\NAT@mbox` 50
`\NAT@mbox` 1309, 1359
`\NAT@merge` 29, 48, 52, 125
`\NAT@merge` 602, 1387, 3449

<code>\NAT@separator</code>	1345
<code>\NAT@set@cites</code>	48, 124
<code>\NAT@sort</code>	48, 106
<code>\NAT@space</code>	1311, 1345, 1348, 1350
<code>\NAT@spacechar</code>	1311
<code>\NAT@swatrue</code>	1329
<code>\NAT@thebibliography</code>	1452
<code>natbib</code>	118
<code>natbib</code> document class	10–12, 19, 34, 48–53, 55–57, 74, 106, 125
<code>natbib.cfg</code>	48
<code>\NATx@bibnumfmt</code>	368, 1405
<code>\NATx@bibsetnum</code>	1388, 1391
<code>\NATx@bibsetup</code>	1393, 1401
<code>newabstract</code> document class option	28
<code>\newblock</code>	1387, 3036, 3426
<code>\newbox</code>	1091, 1123, 1212, 1812, 1813
<code>\newcolumntype</code>	1235
<code>\newif</code>	20
<code>\newif</code>	1717
<code>\newlabel</code>	774
<code>\newlinechar</code>	1571
<code>\newwrite</code>	1564, 1971
<code>\noalign</code>	1889, 2972, 2973
<code>nobalancelastpage</code> document class option	16
<code>noeprint</code> document class option	20
<code>nofloats</code> document class option	45
<code>nolongbibliography</code> document class option	19
<code>nomerge</code> document class option	29
<code>nopreprintnumbers</code> document class option	17
<code>\normalfont</code>	805, 842, 971, 980, 989, 998, 1007, 1278, 1322, 1465, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 2742, 2750, 2830, 2844, 2856, 2867, 2876, 2886, 2899, 2911, 3238
<code>\normallineskip</code>	1015
<code>\normalsize</code>	116
<code>\normalsize</code>	998, 1007, 2033, 2077, 2200, 2201, 2357, 2358, 2421, 2422, 2867, 2876, 3138, 3139, 3158, 3159, 3299, 3300, 3377
<code>\notesname</code>	68
<code>\notesname</code>	1845
<code>\numbername</code>	1865
numerical document class option	21
O	
<code>\obsolete@command</code>	1932, 1933, 1934, 1935
<code>\oc</code>	2611
<code>\oddsidemargin</code>	15
<code>\oddsidemargin</code>	2257, 2259, 2263, 2478, 2482
<code>\ol</code>	2612
<code>oldabstract</code> document class option	28
<code>\oneapage</code>	1102, 1177, 1226
<code>onecolumn</code> document class option	20, 35
<code>\onecolumn@grid@setup</code>	393
<code>\onecolumngrid</code>	1762, 1774, 1792, 2664
<code>\onecolumngrid@pop</code>	1173, 1191, 3033, 3082, 3084
<code>\onecolumngrid@push</code>	1170, 1184, 3025, 3076
<code>oneside</code> document class option	20
<code>\onlinecite</code>	48
<code>\onlinecite</code>	1409, 1432
<code>\open@column@mlt</code>	1710
<code>\open@column@one</code>	1704
<code>\open@column@two</code>	20
<code>\open@column@two</code>	1703
<code>\open@onecolumn</code>	1703
<code>\open@twocolumn</code>	391, 1709
<code>\openone</code>	2077
<code>\openout</code>	59
<code>\openout</code>	1576, 1972
<code>\OptionNotUsed</code>	670
<code>options</code>	13
<code>osa</code> document class option	12
<code>osa.rtx</code>	12
<code>osajnl.rtx</code>	25
<code>outputdebug</code> document class option	27
<code>\outputdebug@sw</code>	580
<code>\overcirc</code>	76
<code>\overcirc</code>	2078
<code>overcite</code> document class	10
<code>\overdots</code>	76
<code>\overdots</code>	2078
<code>\overfullrule</code>	438

<code>\overstar</code>	2102	<code>\place@bibnumber</code> 365 , 1406 , 3211 , 3214
P		<code>\place@bibnumber@inl</code> 369 , 3211
<code>\p@enumii</code>	797	<code>\place@bibnumber@sup</code> 112
<code>\p@enumiii</code>	800 , 803	<code>\place@bibnumber@sup</code> 366 , 369 , 3214
<code>\p@enumiv</code>	803	placeholder
<code>\p@paragraph</code> ...	882 , 907 , 3333	<code><code specific to the josaa></code> 13
<code>\p@section</code>	870 , 895 , 3321	<code><journal-specific setup></code> ... 34
<code>\p@subparagraph</code> .	886 , 911 , 3337	<code>\pof</code>
<code>\p@subsection</code> ...	874 , 899 , 3325	<code>\pop</code>
<code>\p@subsection</code> ...	878 , 903 , 3329	<code>\post@absbox</code>
<code>\PackageError</code>	1997	<code>\ppname</code>
<code>\PackageWarning</code>	2005	<code>\pra</code>
<code>\PackageWarningNoLine</code> ...	2056	pra document class option . 4 , 108
<code>\pacs</code>	3240	prab document class option 4 , 110
<code>\PACS@warn</code>	3240	prapplied document class option 4 , 111
<code>\pagenumbering</code>	63	<code>\prb</code>
<code>\pagenumbering</code>	808	prb document class option . 4 , 108
<code>\pageref</code>	1567	<code>\prc</code>
<code>\paperstyle</code>	91	prc document class option . 4 , 108
<code>\paperheight</code>	15 , 35	<code>\prd</code>
<code>\paperheight</code>	325	prd document class option . 4 , 108
<code>\paperwidth</code>	15 , 35	<code>\pre</code>
<code>\paperwidth</code>	325	pre document class option . 4 , 109
<code>\par</code>	72	<code>\pre@bibdata</code>
<code>\parbox</code>	240	<code>\pre@bibdata</code> . 1439 , 1443 , 1445 , 1450 , 1576 , 3021
<code>\parindent</code>	943 , 957 , 995 , 1004 , 1077 , 1267 , 1749 , 1750 , 2298 , 2524 , 2683 , 2768 , 2775 , 2864 , 2873 , 2937 , 2977 , 2989 , 3079 , 3292 , 3346 , 3356 , 3364 , 3372 , 3376	<code>\prec</code>
<code>\parsep</code> 831 , 1400 , 1752 , 2217 , 2218 , 2230 , 2231 , 2309 , 2319 , 2320 , 2327 , 2372 , 2373 , 2384 , 2385 , 2438 , 2439 , 2451 , 2452 , 2533 , 2541 , 2542 , 2547		<code>\precsim</code>
<code>\parshape</code>	64	<code>\prep@absbox</code>
<code>\parskip</code> . 2297 , 2523 , 2716 , 2738 , 2745 , 2769 , 3080 , 3250		<code>\prep@math@patch</code>
<code>\part</code>	931	<code>\prepdef</code>
<code>\partname</code>	68	prepdef . . 401 , 1167 , 1168 , 1169 , 1355 , 2999
<code>\partname</code>	946 , 1845	<code>\preprint</code>
<code>\partopsep</code> 2300 , 2328 , 2526 , 2547		preprint 2800 , 2805 , 2810
<code>\phantomsection</code>	919 , 3040	preprint document class option 15 , 90
physrev document class option 4 , 111		<code>\preprint@count</code> 2800 , 2818
<code>\pl</code>	2613	<code>\preprint@ocr</code>
<code>\place@bibnumber</code> 19 , 35 , 52 , 112		<code>\preprint@hlist</code> 2805 , 2819
		<code>\preprint@sw</code>
		<code>\preprint@sw</code>
		preprintnumbers document class option 17
		<code>\preprintsty@sw</code> . 16 , 17 , 21 , 35 , 65 , 91

`\preprintsty@sw` .. 265, [278](#), 316,
414, 1823, 2672, 2697, 2700,
2729, 2736, 2789, 3245, 3279,
3298
`\present@bibnote` 54
`\present@bibnote` [1451](#)
`\preserve@LaTeX` 525, 529
prfluids document class option 4,
111
`\print@float` . 1102, 1104, 1177,
1179, 1226, 1228
`\print@toc` 1036, 1125, 1215, 1979,
2922
`\printendnotes` 57, 60, 68
`\printendnotes` [1589](#)
`\printfigures` 42, 43, 68
`\printfigures` 1097, [1099](#)
`\printtables` 21, 44, 45, 68
`\printtables` 1145, [1162](#)
`\printvideos` 46
`\printvideos` 1221, [1223](#)
`\prl` 2621
prl document class option . 4, 109,
110
prmaterials document class option
..... 4, 111
`\ProcessOptions` 25, 29
`\produce@preprints` . 2782, [2796](#)
`\produce@RRAP` 3272
`\protectdef@boldmath` . 253, 261
`\protected@write` 59
`\protected@xdef` 1531
`\providecommand` 784, 1638, 1943,
1944, 1945
`\providecommand@j@nk` 1638, 1675
`\ProvidesClass` 13
`\ProvidesFile` 87
`\ProvidesFile` ... 5, 6, 7, 8, 9, 12
`\ProvidesPackage` 6, 13
`\ProvidesPackage` 10
prper document class option 4, 110
prx document class option . 4, 110
`\ps@article` [726](#), 2708
`\ps@article@final` [726](#)
`\ps@headings` [701](#)
`\ps@myheadings` [701](#)
`\ps@preprint` [726](#), 2701
`\ps@titlepage` [2778](#)
`\pspie` 2625
`\Published@name` [1867](#)
`\punct@RRAP` 2762

Q

`\quad` 709, 715, 727, 728, 736, 737,
758, 759, 2790, 2820, 3275

R

raggedbottom document class op-
tion 22
`\raggedcolumn@sw` [421](#), 2968
`\raise` ... 2061, 2121, 2125, 2174
README 5
README-REVTEX.txt 6
`\Received@name` [1867](#)
`\RecordChanges` 25
`\ref` 1391, 1567
`\references` 1876
`\refname` 68
`\refname` . 1331, 1335, [1849](#), 3041,
3431
`\relax` 55, 57, 107
`\renewenvironment` 2662
`\replace@command`
.. 1872, 1873, 1895, 1896,
1897, 1898, 1899, 2078, 2079,
2080
`\replace@environment` 927
`\RequirePackage` 25
`\RequirePackage` 21,
23, 498, 501, 510, 519, 597,
786, 1382, 1961, 3128
`\reserved@a` 222, 225
`\restore@LaTeX` 538, 549
`\REV@` 69
`\REV@bbox` 1915
`\REV@bm` 1928, 1941
`\REV@boldclose` 2164, 2165, 2166,
2167, 2178
`\REV@boldopen` . 2160, 2161, 2162,
2163, 2177
`\rev@citealp` 48
`\rev@citealp` [1282](#), 1409
`\rev@citealpnum` 48
`\rev@citealpnum` [1282](#)
`\rev@citemark` 1542, 1597
`\rev@citset` 48
`\rev@citset` [1282](#), 1410
`\REV@dddot` 2084, 2180
`\rev@endtext` 1545, 1598
`\REV@gtrsim` 2092, 2185

<code>\sectionmark</code>	706, 723, 732, 741, 763	
<code>\select@column@grid</code>	..... 20	
<code>\select@column@grid</code>	.. 388, 397	
<code>\set@colht</code>	..... 1705, 1711	
<code>\set@footnotewidth</code>	1765, 1796, 1816	
<code>\set@footnotewidth@two</code>	.. 1765, 1796, 1816	
<code>\set@linepenalties</code>	..... 72	
<code>\set@linepenalties</code>	. 2016, 2017	
<code>\set@listindent</code>	..... 1715	
<code>\set@listindent@</code>	..... 1715	
<code>\set@page@grid</code>	..... 1814, 1831	
<code>\set@table@environments</code>	. 1130, 1142	
<code>\set@tocdim@pagenum</code>	.... 2935	
<code>\setfloatlink</code>	..... 1083	
<code>\setup@hook</code>	11, 14, 63, 74, 75, 78, 80, 91	
<code>\setup@hook</code>	..... 231, 315, 399, 415, 424, 434, 437, 443, 451, 603, 1686, 1831, 1942, 2033, 2255, 2476, 2495, 2699, 3018, 3022, 3061, 3066, 3115, 3126, 3132, 3213, 3297, 3426, 3441	
<code>\setup@secnums</code>	..... 23, 37	
<code>\setup@secnums</code>	... 452, 455, 457	
<code>\sf</code>	..... 1833	
<code>\sf@size</code>	..... 1907	
<code>\sffamily</code>	1833, 3238, 3344, 3354, 3362	
<code>\shipout</code>	..... 33	
<code>\showKEYS@sw</code>	..... 16, 35	
<code>\showKEYS@sw</code>	..... 268, 292	
showpacs document class option	15	
<code>\showPACS@sw</code>	..... 16, 35	
<code>\showPACS@sw</code>	..... 267, 292	
<code>\sim</code>	..... 2087, 2088, 2099	
<code>\sjqe</code>	..... 2626	
<code>\skip</code>	..... 15	
<code>\skip@</code>	1488, 2712, 2717, 2722, 2725, 2939, 2942, 3044, 3046, 3048, 3050, 3052	
<code>\sl</code>	..... 1837	
<code>\slantfrac</code>	..... 1896	
<code>\small</code>	..... 44, 84	
<code>\small</code>	..... 971, 980, 989, 1047, 1127, 2077, 2208, 2209, 2365, 2366, 2429, 2430, 2682, 2733, 2757, 2799, 2830, 2844, 2856, 2886, 2899, 2911, 3068, 3146, 3147, 3254, 3268, 3344, 3354, 3362, 3370, 3402	
sort document class option	... 48	
sort\&compress document class option	..... 48	
<code>\spacefactor</code>	.. 1423, 1426, 1429	
<code>\splittopskip</code>	..... 2273, 2492	
<code>\squeezetable</code>	..... 44	
<code>\squeezetable</code>	..... 1127	
<code>\ssf@size</code>	..... 1908	
<code>\stepcounter</code>	..... 1530	
<code>\string</code>	..... 223, 224, 255, 319, 774, 1158, 1160, 1412, 1586, 1590, 1881, 1885, 1890, 1929, 1948, 1957, 1998, 2006, 2012, 2130, 2131, 2138, 2146, 2147, 2154, 2921, 2923, 3208, 3240, 3423	
<code>\subitem</code>	..... 3089	
<code>\subparagraph</code>	.. 1000, 2869, 3375	
<code>\subsection</code>	973, 2705, 2836, 3351	
<code>\subsection@preprintsty</code>	. 2705, 2878	
<code>\subsectionmark</code>	.. 712, 724, 733, 749, 764	
<code>\substyle@ext</code>	.... 611, 657, 669, 676, 689, 2191, 2348, 2412, 2561, 3223	
<code>\substyle@post</code>	... 611, 657, 668, 676, 689, 3212, 3409	
<code>\subsubitem</code>	..... 3091	
<code>\subsubsection</code>	. 982, 2706, 2848, 3359	
<code>\subsubsection@preprintsty</code>	.. .. 2706, 2878	
<code>\succ</code>	..... 2087	
<code>\succsim</code>	..... 2087, 2182	
super document class option	.. 55	
<code>\super@cite@check</code>	.. 1496, 1501	
<code>\super@cite@end</code>	..... 1482	
<code>\super@cite@let</code>	..... 1482	
<code>\super@cite@swap</code>	..... 55	
<code>\super@cite@swap</code>	..... 1482	
superscript document class option	..... 56	
superscriptaddress document class option	..... 114	
<code>\switch@longtable</code>	..... 233	

T	
<code>\tabbingsep</code>	1687
<code>\tabcolsep</code>	1024
<code>table</code> (env.)	1111
<code>table</code> environment ..	3, 43–45, 68
<code>\table@hook</code>	44
<code>\table@hook</code>	1127
<code>\tableleft@skip</code> ..	1245, 1246, 1258
<code>\tableleft@skip@default</code> ...	1245, 1258
<code>\tableleft@skip@float</code>	1246, 2969
<code>\tableline</code>	1888, 1890, 1891, 1893
<code>\tablename</code>	68
<code>\tablename</code>	1122, 1853
<code>\tablenote</code>	1897
<code>\tablenotemark</code>	1898
<code>\tablenotetext</code>	1899
<code>\tableofcontents</code>	68
<code>\tableofcontents</code>	48, 2920
<code>\tablesname</code>	68
<code>\tablesname</code>	1854
<code>\tablewrite</code>	1158, 1160
<code>\tabmid@skip</code> ..	1247, 1248, 1259
<code>\tabmid@skip@default</code>	1247, 1259
<code>\tabmid@skip@float</code> .	1248, 2969
<code>\tabright@skip</code> .	1249, 1250, 1260
<code>\tabright@skip@default</code> ..	1249, 1260
<code>\tabright@skip@float</code>	1250, 2969
<code>tabular</code> environment	15
<code>\tabular@hook</code>	1231
<code>\tag</code>	1957
<code>\tally@box@size@sw</code> ...	435, 781
<code>\tempa</code>	1987, 1988
<code>template.aps</code>	5
<code>template.rty</code>	73
<code>\tensor</code>	2102
<code>\test@amsmath@ver</code>	527, 547
<code>\test@bbl@sw</code>	1615
<code>\TeX</code> .	34, 37, 179, 182, 205, 2795
<code>\text</code>	1940
<code>\textasteriskcentered</code>	806
<code>\textbf</code>	1649
<code>\textbullet</code>	804
<code>textcase</code> document class	25
<code>\textcite</code>	48, 125
<code>\textcite</code>	1410, 1432
<code>\textendash</code>	805
<code>\textfloatsep</code>	2286, 2512
<code>\textfraction</code>	814
<code>\textheight</code>	15
<code>\textheight</code> ..	1186, 2275, 2494, 3169
<code>\textheight@sw</code>	590
<code>\TextOrMath</code>	89
<code>\TextOrMath</code>	2656, 2657
<code>\textperiodcentered</code>	807
<code>\textstyle</code>	1906, 1920, 2072, 2110
<code>\textsuperscript</code>	369, 1322, 1464
<code>\texttt</code>	128, 131, 146
<code>\textwidth</code>	15
<code>\textwidth</code>	416, 417, 1185, 2276, 2502, 2687, 2702, 3028
<code>\thanks</code>	18
<code>\thanks</code>	31, 34
<code>\thebibliography</code>	1876
<code>thebibliography</code> environment	48, 51, 54, 60, 62, 63, 68, 99, 118, 133
<code>\thebibliography@nogroup</code>	1615
<code>thebibliography@nogroup</code> environ-	ment
	63
<code>\thebibliography</code>	54
<code>\theenumi</code>	793, 794, 797, 800
<code>\theenumii</code>	795, 796, 800
<code>\theenumiii</code>	798, 799, 803
<code>\theenumiv</code>	801, 802
<code>\theequation</code>	1009
<code>\theequation@prefix</code>	446, 1010, 1012, 1727, 1731
<code>\thefigure</code>	1085
<code>\thefootnote</code>	19
<code>\thefootnote</code>	1596, 2660
<code>\thefootnote@latex</code>	2660
<code>\theHvideo</code>	1214
<code>theindex</code> environment	68
<code>\thempfn</code> .	1531, 1596, 1605, 1609
<code>\thempfn@latex</code>	1605, 1609
<code>\thepage</code>	63
<code>\thepage</code> .	703, 704, 720, 721, 727, 728, 736, 737, 758, 759, 774, 1685, 2789
<code>\theparagraph</code>	861, 880, 881, 886, 905, 906, 910, 3331, 3332, 3337
<code>\thepart</code> .	853, 865, 866, 890, 891, 938, 946, 3316, 3317
<code>\thesection</code> .....	.. 709, 744, 855, 868, 869, 874, 878, 882, 886, 893, 894,

898, 1727, 1730, 1733, 3319, 3320, 3325, 3329, 3333, 3337	<code>\topmargin</code> 2269, 2488
<code>\thesubparagraph</code> . 863, 884, 885, 909, 910, 3335, 3336	<code>\toprule</code> 1239
<code>\thesubsection</code> . . . 715, 751, 857, 872, 873, 878, 882, 886, 897, 898, 902, 1724, 3323, 3324, 3329, 3333, 3337	<code>\topsep</code> . . 1390, 1399, 1748, 2216, 2229, 2310, 2318, 2326, 2329, 2371, 2383, 2437, 2450, 2534, 2540, 2546, 2548
<code>\thesubsubsection</code> 859, 876, 877, 882, 886, 901, 902, 906, 1725, 3327, 3328, 3333, 3337	<code>\topskip</code> . 2272, 2273, 2491, 2492
<code>\thetable</code> 1117	<code>\total@text</code> 781
<code>\thevideo</code> 1199	<code>\traceoutput</code> 588
<code>\thispagestyle</code> 2666, 3078	<code>\translation</code> 1641
<code>\thr@@</code> 29	<code>\triangle</code> 2082
<code>\thr@@</code> 1407, 1679, 3312	<code>\triangleq</code> 76
<code>\tighten</code> 1884, 1885	<code>\triangleq</code> 2078, 2181
<code>\tightenlines@sw</code> 22, 35	<code>\trigger@float@par</code> . 1167, 1168
<code>\tightenlines@sw</code> 427 , 1886, 2496	<code>\true@sw</code> 19
times document class 109	<code>\true@sw</code> . 1100, 1175, 1224, 1314, 1619, 1627, 1654, 2040, 2041, 2042, 2657
<code>\tiny</code> 273 , 2237 , 2238 , 2392 , 2393 , 2458 , 2459	<code>\tt</code> 1834
<code>\title</code> 29	<code>\ttfamily</code> 1834
<code>\title@column</code> 65	<code>\tw@</code> 52
<code>\title@column</code> 1736 , 1819	<code>\twocolumn</code> 107
<code>\title@column@grid</code> . 1760 , 1819	twocolumn document class option 16, 20
<code>\titleblock@produce</code> 113	<code>\twocolumn@grid@setup</code> 390
<code>\titlepage</code> 2662	<code>\twocolumn@sw</code> 20, 35, 65
<code>\titlepage@sw</code> 24, 35, 91	<code>\twocolumn@sw</code> . . . 284, 385 , 1815, 2663
<code>\titlepage@sw</code> . . 466, 2698, 3188	<code>\twocolumngrid</code> 64
<code>\toc@font</code> 126	<code>\twocolumngrid</code> 1769, 1775, 1809, 2669
<code>\toc@font</code> 3453	twocolumngrid document class op- tion 65
<code>\toc@post</code> 126	twoside document class option 20
<code>\toc@post</code> 1975, 2967, 3473	<code>\twoside@sw</code> 20, 35, 80
<code>\toc@post@auto</code> 2967, 3473	<code>\twoside@sw</code> . . . 379, 2256, 2477
<code>\toc@pre</code> 126	
<code>\toc@pre</code> 1967, 2966, 3472	
<code>\toc@pre@auto</code> 2966, 3472	
<code>\tocdepth@munge</code> 2921, 2925	
<code>\tocdepth@restore</code> . . 2923, 2930	
<code>\tocdim@min</code> 2949, 3459	
<code>\tocleft@</code> 2948, 3458	
<code>\tocleft@pagenum</code> 2938	
<code>\tocname</code> 68	
<code>\tocname</code> 1846	
<code>\today</code> 68	
<code>\today</code> 273, 1841	
<code>\topfraction</code> 810	
<code>\topmargin</code> 15	

U

<code>\undefined</code> 17, 20, 34, 35
<code>\unhbox</code> 1061, 2943
<code>\unskip</code> 241, 243, 756, 842, 1320, 1371, 1489, 1730, 2760, 2942, 3275
<code>\unvbox</code> 72
<code>\url</code> 22, 45, 1940
<code>\usepackage</code> 11, 25, 26, 73

V

<code>\vbox</code> 1185 , 1637 , 1780, 1802, 2096, 3400
--

`\ver@amsmath.sty` 26
`\ver@amsmath@prefer` . 519, 551,
 554, 562
`\vereq` 2091, 2092, 2095
`video` (env.) [1193](#)
`video` environment 3, 45, 46
`\voffset` 15
`\volumename` [1866](#)
`\vr` 2627
`\vrule` . 241, 243, 1784, 1789, 2064
`\vss` 2813
`\vtop` 2797

W

`\wastwocol@sw` 2663, 2669
`\widetext@bot` . 1788, 1802, 1803,
 1806, 1807, 1813
`widetext@galley` (env.) ... [1744](#)
`widetext@grid` (env.) [1778](#)
`\widetext@outdent` . 1745, 1753,
 1826
`\widetext@top` . 1780, 1794, 1795,
 1812
`widetttext` environment 66
`\write` 774, 1158, 1160, 1555, 1579,
 1586, 3197, 3208, 3412, 3423
`\write@float` 1148, 1153
`\write@bibliographystyle` .. 55
`\write@bibliographystyle` [1474](#),
 1474, 1479, 1481
`\write@column@totals` 784

X

`\xpt` 3300

Z

`\z@` 48, 125
`\z@skip` .. 1748, 2745, 2769, 2943,
 3250